

MOTOR AGE

Maxwell 35-4

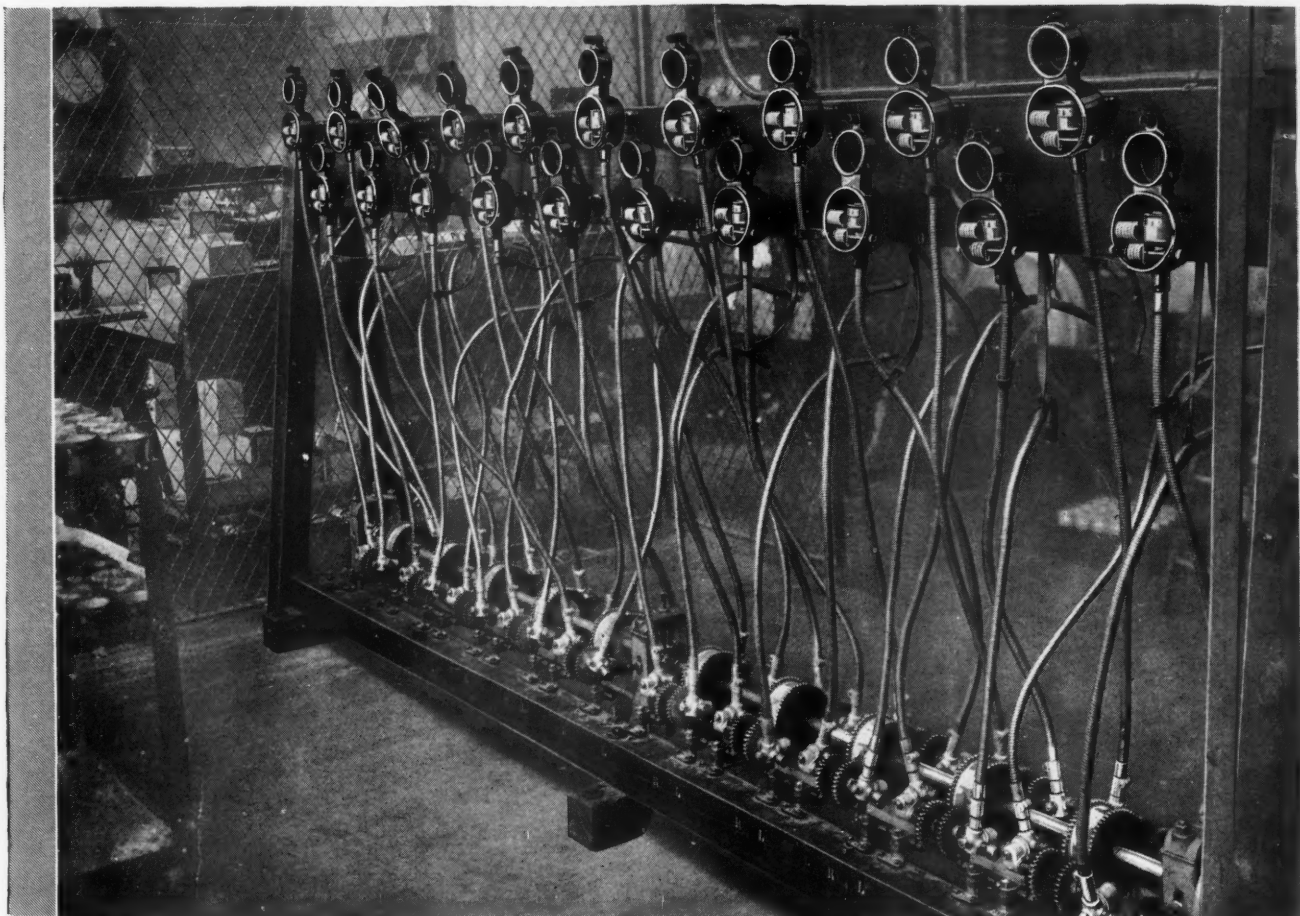
Completely Equipped

\$1085 with electric starting & lighting \$1225

The "Family Car"—All there is of comfort, and power, at a price the average buyer wishes to pay.

Maxwell Motor Company
Detroit, U. S. A.





WARNER

QUALITY AUTO-METER

Providing Surplus Speed Capacity

EVERY part of every Warner Auto-Meter made must be proven absolutely correct in the most severe speed tests before our expert inspectors pass it for final assembly and shipment.

The specially constructed testing machine shown above is designed for thoroughly trying out every part of the instrument. Sixty miles an hour is excessive motor car speed. This test is made at the rate of 150 miles per hour. Therefore every Warner has a surplus speed capacity of 250 per cent., in which it has been proven correct.

Absolute accuracy and precision are the qualifications demanded in the test. Speed indicating dials or mileage odometers that show even one-tenth of a mile error are discarded. The swivel joint must work perfectly. The flexible shaft must deliver a constant, even pull. The slightest indication of wear in any part sends the whole instrument to the scrapheap.

No other speedometer on the market is so carefully constructed nor subjected to such expensive and scientific tests as the Warner Auto-Meter.

Service Stations in all important cities all over the world

The Warner Auto-Meter Factory, Beloit, Wisconsin

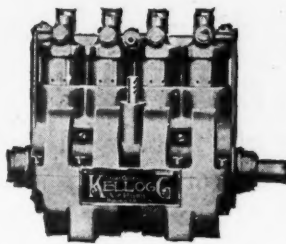
Let the Motor Pump the Tires!

Don't ask a car owner to pump up his tires by hand when there is a 20 to 90 horsepower motor by his side. Hand pumping belongs to the "dark ages," like hand cranking. Hand pumping is the cause of insufficient inflation—the reason for three-fourths of the tire repairs, according to tire authorities.

Save the car owner's comfort, temper, time and money by installing the

Four Cylinder **KELLOGG** Tire Pump

This is the Standard Tire Pump—the choice of practically every maker of high grade cars. This has been proven by four years of successful test.



Its price is moderate. Attachments are supplied for practically every model now in use. Manufacturers, dealers and garages should investigate our proposition. Send for our book—"Air on Tap."

THE KELLOGG MFG. CO.

Circle and Main Sts., Rochester, N.Y.

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1733 Broadway

CHICAGO
1112 So. Michigan Ave.

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444 Market St.



When Writing to Advertisers, Please Mention Motor Age.

Evidence

The Makers of These High Grade Cars Use and Endorse the Standard

Kellogg Tire Pump

Austin Automobile Co.
Chalmers Motor Co.
Dayton Motor Co.
Edwards-Knight Motor Car Co.
Haynes Motor Car Co.
McFarlan Motor Car Co.
Oakland Motor Car Co.
Packard Motor Car Co.
Palmer-Singer Mfg. Co.
Peerless Motor Car Co.
Staver Carriage Co.
Stevens-Duryea Co.
Winton Motor Car Co.

Attachments Supplied for Attaching the Standard

Kellogg Tire Pump

to the Following Makes:

Abbott-Detroit 1912-13. 41 50
American 1912-13
Apperson 1912
Bergdoll "30"
Buick 1914 models in preparation
Cadillac 1911-12-13-14
Chalmers "30" (36 and 6 cyl. attachment from Chalmers factory)
Cole 1912-13, "40," "50," "60"
F. I. A. T. "54," "55," "56"
Flanders "6"
Haynes 1913 "23," "24"
Hudson "33," "37," "54" and 1914
Imperial 1914
Jackson 1913
Kissell 1913, 4 cyl. and 6 cyl.
Locomobile, I. L. M. R.
Lozier 1911-12-13-14—all models
Marmon 1912
Oakland 1913—all models
Packard "30," Nos. "1248," "1338," "1348," "238"
Paige-Detroit 1913
Pierce-Arrow (all models, 1907 to date).
Selden (all models)
Simplex "38," "50"
Speedwell 1914
Stearns 1913 and 1914, 4 and 6 cyl.
Knight
Stevens-Duryea "AA," "X," "Y"
Studebaker "6," 1914
Warren-Detroit 1913
Winton "6" (all models, 1910 to date)

New Automatic Shock Absorber Gives Motoring Comfort a New Meaning

The standard of car comfort has been raised. Manufacturers today are making extra provisions for the motorist's comfort. Deeper upholstery, longer springs and larger tires have all helped in making easier riding cars.

But the greatest step in the perfection of motor car comfort has been the New Automatic Truffault-Hartford Shock Absorber.

Without it the motorist cannot realize the utmost motor comfort. It is as much a necessary part of each spring as the carburetor is of every engine.

Chief among the advantages of this new type of the famous Truffault-Hartford are its three frictional tensions, providing a separate spring control for every kind of road.

The first of these tensions, very slight, exercises the proper degree of absorption needed to take up the small but disagreeable spring oscillation generated by the car's speed on comparatively smooth roads. It does not encumber full play of the spring.

A second tension comes into play when the roadbed grows moderately rough. It offers a frictional resis-

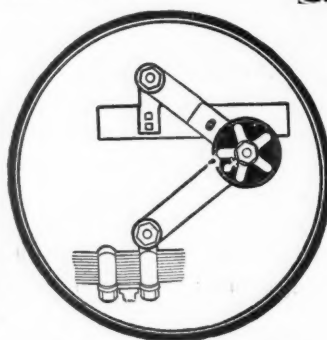
tance that meets this new demand to a nicety, continuing to maintain normal spring action.

A third tension responds to a change from smooth or moderately rough roads to roads of extreme roughness. This last tension is an absolute guard against jolts and jars that occur when the wheels hit a car track, cross-walk or culvert at high car speed.

All tensions respond with unfailing regularity. The New Automatic lengthens the life of the tires, prevents spring breakage and brings unsurpassed ease of riding.

Any car, no matter how stiff or flexible its spring equipment is easily fitted with the

New Automatic **Truffault-Hartford** **SHOCK ABSORBER**



Catalog on Request

And any car fitted with this device is a better car. These absorbers are neatly interposed between the axle and frame where they cannot injure appearance. \$60 per set of four. Other Truffault-Hartfords from \$15 to \$50. Order from your dealer today.

Insist Upon Truffault-Hartfords on Your New Car

HARTFORD SUSPENSION CO.

EDWARD V. HARTFORD, Pres.

Office and Works: 146 Bay St., Jersey City, N. J.

Manufacturers of Hartford Electric Lighting and Starting System

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MOTOR AGE

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Volume XXIV

OCTOBER 2, 1913

No. 14

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Finding a Market

You can't sell straw hats to the Esquimaux. There is *no market* for straw hats in Greenland.

You can't sell automobile tires to shop girls. A department store furnishes *no market* for tires.

For that reason *The Esquimaux Times* would offer a straw hat advertiser just exactly *100% waste circulation*. A tire ad in Marshall Field's house organ would be charity.

The value of any advertising medium as a market depends on the *desire* of its readers to buy, and their *ability* to buy. Esquimaux don't *want* straw hats; shop girls *couldn't* buy a tire if they wanted to.

In any *general* advertising medium the trend toward a *no market* is necessarily great. Grant that ten readers *see* your tire, horn, or car ad in a general medium. Grant that three of them are \$15-a-week clerks, two school children, one a stenographer, three business men on \$2,500 a year, and *one a motor car owner*.

Nine of these readers neither *want*, nor have the *ability*, to buy your car, horn, or tire.

Grant that the *one* car owner *wants* to, and is *able* to buy your product. Then as far as these ten readers are concerned, the general medium has sold you *90% waste circulation*. You *pay* for a 100% market, and get a 10% market.

The prudent seller always goes to the market where there are the *most* buyers. Approximately 98% of the readers of MOTOR AGE own a car—sometimes two, three, four, or five cars.

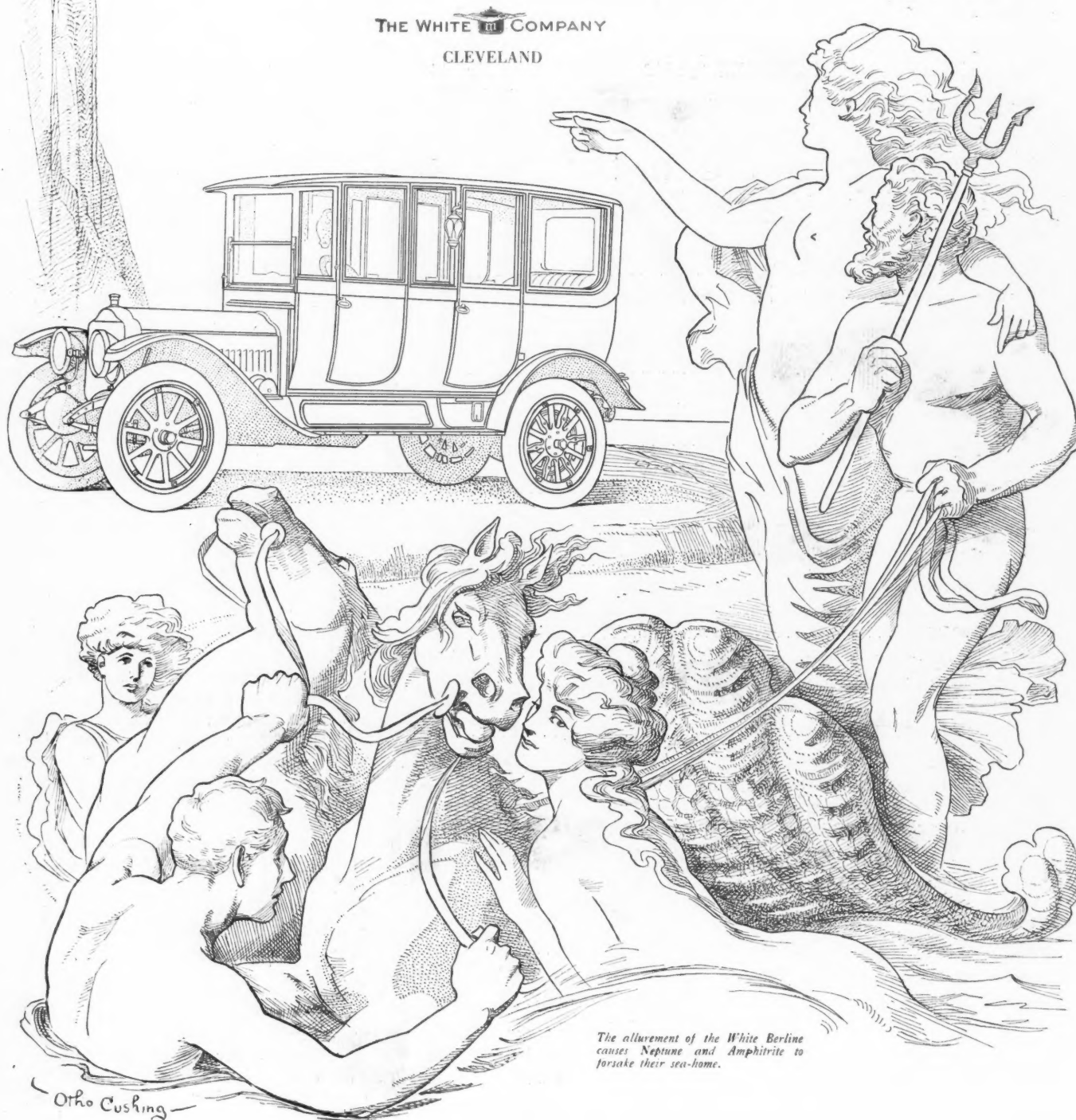
These motorists are the *buyers* of the new cars, tires, spark plugs, lubricants, and a world of other accessories, that you car and accessory manufacturers are *selling*. These buyers *want* your product, if anyone does. They have the *ability* to purchase it.

Better get together!

Fascination

The WHITE BERLINE, even to the naturally prejudiced owner of a car of another make, has an irresistible attraction, once its quality is inquired into and its performance known. Where sentiment for another car has not prevented investigation, it will be found that the WHITE BERLINE *alone* possesses *all* of the correct and fundamental features of construction, and wealth of appointments, without which, a car of this type is today practically obsolete.

THE WHITE  COMPANY
CLEVELAND

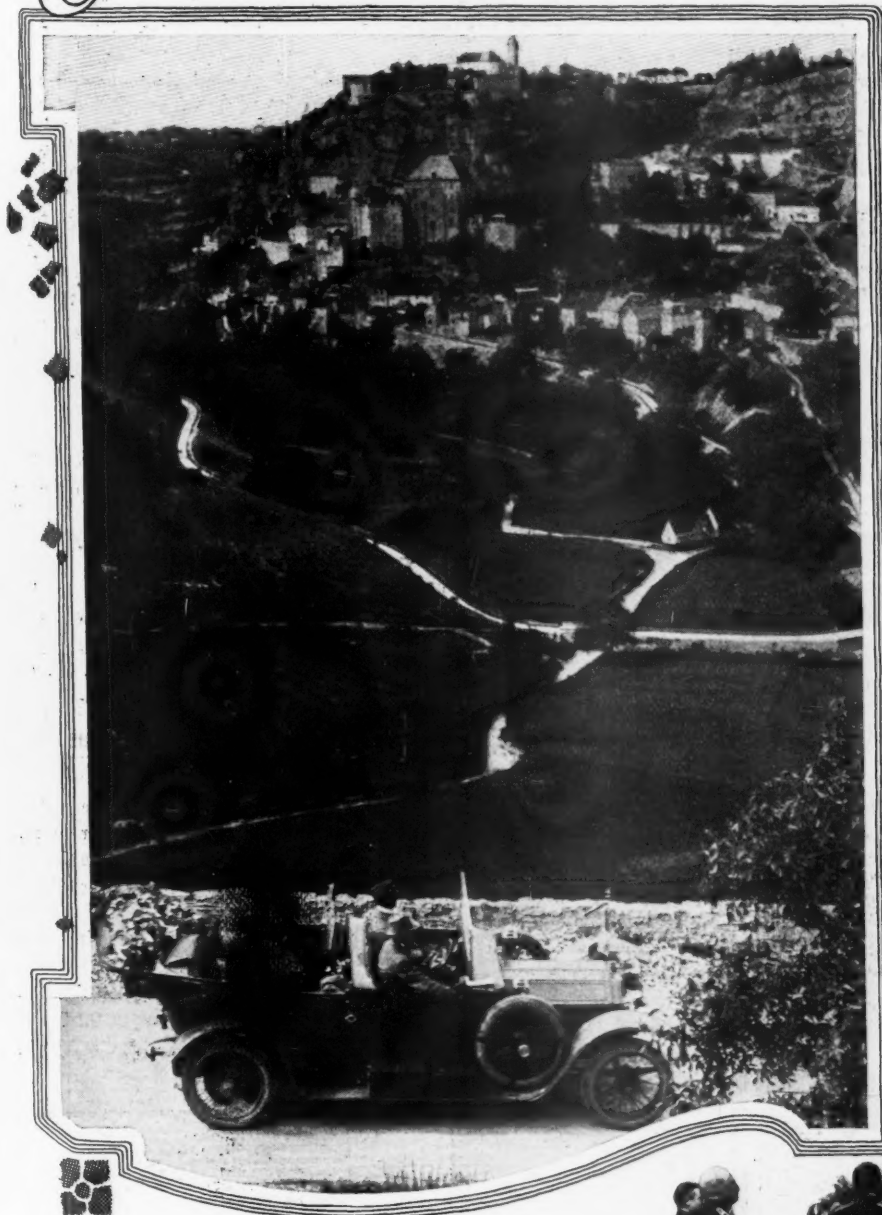


The allurements of the White Berline causes Neptune and Amphitrite to forsake their sea-home.

When Writing to Advertisers, Please Mention Motor Age.

MOTOR AGE

En Tour With the French President



Scenic Beauties of Quaint Old Limousin Officially Inspect- ed by Motor Party

By W. F. Bradley

PARIS, Sept. 20.—Perhaps you never have toured in France; or, if you have been to this fair country, your travels have been confined to those broad, straight, military highways on which you eat up tires and put the cooling and lubricating systems of your motor to the most severe test. You are not alone in having this limited knowledge of France. Many a Frenchman is equally limited, thanks to the guide books and road maps which indicate the great highways of travel and neglect the interesting districts.

It was to help to remedy this lack of knowledge that President Poincaré consented to make an official motor tour through Limousin. To the average motorist Limousin was the place in which the limousine body, in some vague way, had its origin; it produced the natives who sell chestnuts on the street corners of Paris in winter—and that is all. Now, Limousin is a country to be visited—just as you visit the Riviera and the Alps and the Pyrenees—and to be marvelled over.

We started from Limoges, the president in his open touring car, the protocol just ahead of him, domestics just behind, presidential officers further in the rear and a whole pack of newspaper men and various



Upper illustration—"A turn of the wheel and Rocamadour bursts into view." Lower illustration—President Poincaré starting on motor tour



1

2

3



1—Limousin children, in native costume, pay homage to President Poincaré. 2—In the shade of century-old churches, wrinkled old women spin flax. 3—Leaving the old fortified town of Domme

straight road. That is about all there is to National highway No. 20, while it takes you from Paris to Limoges after 200 miles of the fastest and most monotonous country you are likely to encounter anywhere.

Then it changed, for the idea of the presidential tour was to see the country, and not to gobble up kilometers, as they express it in France.

Limoges is the porcelain center and the home of Haviland—but the guide books tell all about that. As a sort of appetizer.

the president's first day's run was cut down to about 80 miles. It followed along the banks of the Vienne river for a few miles, then cut across to the opposite side, and by narrow winding lanes climbing up and down the steep banks of the river reached the town of St. Junien. There is

more of the real life of France to be seen in those 20 or 30 miles along the banks of the Vienne than in a whole day's driving over National highway No. 20, or any other national highway.

Time Stands Still

In the shade of century-old churches wrinkled old women spin flax to be woven into linen sheets and table linen capable of doing service for a generation or more. On the heather-covered hills the shepherdesses knit or spin while watching their sheep. When the nights are cold the men don a big cloak with a hood covering the



ROUTE OF PRESIDENTIAL PARTY

officials trailing behind in every type of modern and ancient motor cars. We personally reached Limoges over National highway No. 20. Ten miles dead straight; a few cottages; 15 miles dead straight; a small town; a few more miles dead straight; a few more cottages, then more

head and almost hiding the face. It is the original limousine, although having very little apparent connection with the article now known under that name.

A coachbuilder from this part of France gave the name to a new body he had produced. After being used on horse vehicles the body was applied to motor cars, and the limousine body is now far better known and much more often seen than the limousine cloak. The countryside is rich in chestnut trees, which flourish despite a rather poor soil. They form an important harvest, and during the winter months many a Limousin sells them in Paris to the cry of "chaud les marrons."

From Limoges to La Courtine

Limoges to La Courtine comprised the second day's run. It is wild and yet picturesque country. For the first 20 miles just wild heather-covered moorland, with a broad, brick red highway well kept and offering an open invitation to speed. Then a drop into Eymoutiers. You certainly never have heard of the town; and there are scores more in this central mountain range which never have been visited by the motorist from abroad and are hardly known to the motorist at home. They are just old-world villages built by the sides of trout streams in the deep, thickly-wooded valleys of this mountain district. More wild moorland, an occasional dip into a smiling valley, a climb out by a steep winding road, then about 15 miles across moorland majestic in its wildness to the military center of La Courtine. This is one of the most important camps in France, measuring 10 miles in length by 5 miles in width and capable of receiving 20,000 men. A group of barrack buildings, a few houses, a barber's

shop, a couple of hotels patronized by the officers, and all around it as far as the eye can reach mountain moorland. It is a grim business training men for war, and at La Courtine it is carried out amid grim surroundings.

Perhaps it was intended to be a contrast, for the third day's run on the president's trip quickly left the wild moorland behind and got into picturesque hill country. It was still wild, but not the barren wildness of the previous day. The finest portion of the run was the long winding descent into the Gorges de Dordogne.

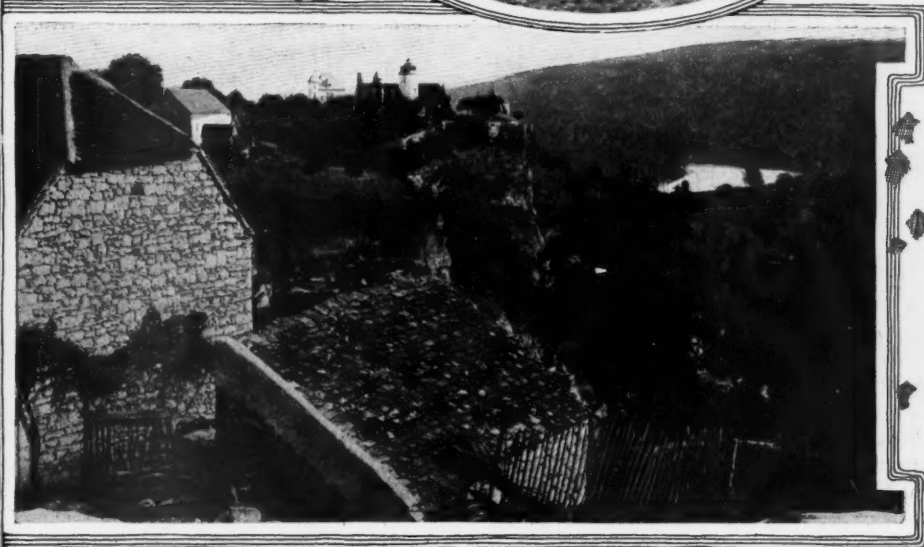
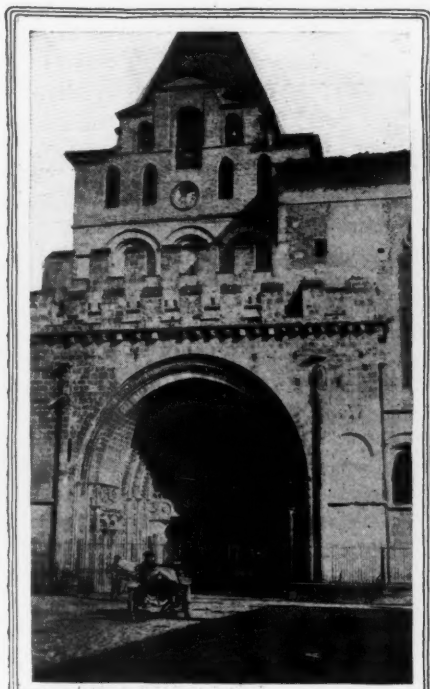
When nature formed this region she cut deep, wild gulleys, sent the silent Dordogne to wind its way through, and covered the sides of the cliffs with luxurious vegetation. Man built a spidery suspension bridge over the river, cut out a winding, well-surfaced road down the side of the cliff and up again.

For the first time in the history of France a presidential motor procession of sixty cars slowly descended that mountain road; one by one the cars were ad-

mitted to the bridge, then climbed up the opposite side of the gully. Those in the rear of the procession could look across the narrow valley and watch the leaders climbing up the opposite side. More wild country, through villages rarely visited by motorists, and never before by a president, then a beautiful descent to picturesque Argentat, built on the banks of the river Dordogne.

In Picturesque Country

As the first car is espied on the top of the zig-zag road overlooking the town, a tricolor flag is sent up to the top of the



1—President Poincaré crossing the river Vienne at Junier. 2—Entrance to the Castle of Pompadour. 3—Cartier built in commanding position on ledges of rock. 4—A twelfth century church in Limousin

mast on the church tower, bells peal forth and somewhere on the opposite range of hills guns boom forth. That day's run finished at Tulle after a run through a rich, languid valley with vineyards, tobacco fields, well-fed cattle and luscious meadows. Tobacco-growing is an interesting and somewhat peculiar pursuit in this part of France. All tobacco is government property and in order to grow it special permission must be obtained; no man can have more than a certain quantity under cultivation and not more than one member of a family can enjoy the privilege. If the father has a tobacco field the sons have to do without. Every leaf is counted and controlled by a government inspector. A tag tied to a stick in the field declares the number of leaves on a given date, the number destroyed by storm or other causes, and the number gathered. Every leaf is sold to the government.

Views Are Magnificent

Tulle to Brive, another day's run of about 130 miles, is more interesting and more beautiful than its predecessors. A fine climb out of the town, a magnificent bird's-eye view over varied country, then just a national highway, straight and fast. Suddenly a drop into a narrow valley with the town of Uzerches built on ledges on one side of the cliff. It is another town unknown to the average traveler, yet, according to the local proverb, "a house in Uzerche is as good as a chateau in Limousin." By reason of its historic associations, its geographic situation and its natural beauty this town alone is worth the run across France.

Twenty miles further the town of Pompadour is reached. Its great attraction is the chateau built in 1026, the scene of many a fierce struggle and the home of some of the great seigneurs of France. It passed into the hands of Louis XV, who bestowed it on Madame Le Norman d'Etiolles with the title of Marquise de Pompadour. Madame visited her princely residence only once, but the apartments she occupied are kept in their original condition. At the present time Pompadour is one of the most important breeding stations for the French army remount service. The officers live in the restored and picturesque chateau; the stables are near by. That day's run continued through the picturesquely wild Correze country and terminated in the important town of Brives.

From Brive to Cahors

If you follow the presidential route from Brive to Cahors, an easy day's run of some 130 miles, you will have seen some of the finest treasures of France. Souillac, a mountain village in which, by the by, you can obtain a lunch equal to that of the best Fifth avenue hotel at one-fifth the price, is reached over a fine road and a magnificent descent into the valley. For the next 20 miles the run is through fairyland. Rich, deep, narrow valleys, deep silent rivers, old-world castles built in commanding positions on ledges

of rock, vines on the hillsides, well-tended tobacco fields, cattle in the green valleys. As if by magic it all changes. It is just a barren plateau, a land obviously of volcanic origin with no beauty to recommend it.

Now Comes Rocamadour

A turn of the steering wheel and Rocamadour bursts into view. Rocamadour is one of the pearls of these central mountains. Imagine a wild gorge with a perfect highway cut on its face and half way down a village built tier above tier on the face of the cliff. The church overlooks the main street, the chateau overlooks the church, the fort towers over the chateau. The road leading into Rocamadour narrows when it reaches the village until there is just room for one vehicle. In the center of the town it takes a sharp turn to the left, continuing down the cliff-side to a very narrow but richly green valley.

Here it turns sharp to the right, crosses the valley, and climbs up the opposite cliff, giving the traveler a beautiful view of the town he has just passed through. The road out of Rocamadour is a magnificent piece of engineering; the town itself is a gem which no lover of the beautiful can afford to ignore. A few miles further on the wild plateau is the Gouffre de Padirac, one of the archaeological marvels of the world. It requires 2 hours to visit it, descending to its depths and exploring as much as is known of its subterranean cave.

Every Mile Interesting

From Rocamadour to Cahors there is not an uninteresting mile of highway. Montal has a twelfth century chateau which has suffered a lot at the hands of collectors from across the water, but has been restored to its original beauty. St. Céré is interesting, Marcillac has some beauty, and the run along the valley of the Cele into Cahors should not be missed.

Two more stages completed this presidential tour. First from Cahors to Perigueux, a full day's run, and then from Perigueux to Bergerac, a short day's trip. On the first of these two trips the finest sight is Domme. Leaving the valley, which is somewhat ordinary, there is a steep climb to a bluff overlooking the river Dordogne. Suddenly an old gateway is passed through and the visitor is within the walls of a small town dating from 1282, having had an important history in the middle ages, having figured prominently in the Hundred Years war, and at this present time being the same in all essential features as it was hundreds of years ago. It seems a sacrilege to bring a motor car into such historic ground, but once the occupants of the car are within these fortified walls they are very loth to leave. If you want to eat well, go to the only inn in Domme; but don't expect to see damask tablecloths or silverware or even a black-coated waiter. The landlord is the cook, his son is the waiter, and his wife makes the paté

de fois gras. His wine makes the heart glad.

To follow out this tour requires 6 or 7 days. But during those days one will learn more of the French nature, see more of its beauty and understand more of its history than in a month scouring national highways and stopping at ultra-fashionable resorts and gilded palace hotels. In the big towns, Limoges, Tulle, Brives, Cahors, Perigueux, the accommodation is all that can be desired. In the smaller places the food is good and the housing is poor. It is no use asking the landlord to serve up American dishes and American drinks. In Limousin you are off the beaten track, where hotelkeepers have not been spoiled by millionaire clients. To visit this district the national roads have to be abandoned and third and fourth class highways entered upon. But these roads have seen so little traffic that they are in much better condition than the best-known main highways.

DODGE COMPANY INCORPORATES

Detroit, Mich., Oct. 1.—Special telegram—The Dodge Motor Car Co. has been incorporated in this city with a capital stock of \$1,000 to build motor cars. The small capitalization is merely a step taken to secure the name. Alvan M. Dodge, secretary and treasurer of the Wahl Motor Car Co., is president of the new concern; E. L. Millay is vice-president, Edwin Hercog, secretary and treasurer; Charles H. Kirby, engineer, and J. Major Lemen, purchasing agent. The concern is now looking for a location here and plans to turn out 500 cars for the 1915 season. The car will sell at about \$800 with touring and roadster bodies. It is stated that the output for the first season is already sold. A four-cylinder motor and wire wheels figure among the specifications.

EIGHT DYER LICENSES ISSUED

New York, Sept. 30.—Eight licenses under the Dyer patents Nos. 921,963, 885,986, 657,650 and 676,223, concerning the direct drive, the transmission, the H-plate and the unit-power plant, respectively, have been issued during July and September to the following companies: Argo Electric Vehicle Co., Saginaw, Mich.; Borland-Grannis Co., Chicago; Broe Electric Vehicle Co., Cleveland, O.; Rauch & Lang Carriage Co., Cleveland, O.; Studebaker Corporation, South Bend, Ind.; Touraine Co., Philadelphia, Pa.; Waverley Co., Indianapolis, Ind.; and the Westcott Motor Car Co., Richmond, Ind.

GOOD ROADS DAYS IN TEXAS

Austin, Texas, Sept. 27.—Governor O. B. Colquitt of Texas has issued a proclamation naming November 5 and 6 as good roads days in this state. He promises to either work the roads during those 2 days himself or to pay \$25 into a good roads fund in lieu of his personal physical labor.

Late News Developments in the Motor Industry

General Motors Shows Big Profit

NEW YORK, Sept. 30—The annual statement of the General Motors Co. for the fiscal year ending July 30, 1913, showed a profit of almost 40 per cent on the common stock of the company, as compared with 18 per cent for the previous year. The exact figures showed that on the common stock, amounting to \$16,476,783, there was a dividend of 38.50 per cent, as compared with 17.44 per cent for the previous year.

The report shows that the net profits of the subsidiary companies after deducting manufacturing, selling, administration and maintenance expenses, together with depreciation, was \$8,284,140 for the fiscal year. This is nearly \$4,000,000 higher than the profits for the same period of the previous fiscal year.

In the report the assets of the company at the end of the fiscal year are placed at \$58,538,160, as compared with \$54,958,150 a year ago. Of this total real estate investment in plants and equipment is placed at \$20,458,978. The next largest item is that of inventories, listed at \$18,170,907. The good will of the company, which represents the excess of appraised value over the book value of the stock of the subsidized companies owned less the reserve, is put at \$7,934,198.

WAGENHALS REORGANIZATION

Detroit, Mich., Sept. 30—The Wagenhals Motor Car Co., Detroit, manufacturer of the three-wheeled motor vehicle of that name, was reorganized on September 27 and its capital stock increased from \$100,000 to \$500,000. William Pfum was elected president, W. G. Wagenhals, vice-president and treasurer; Hughes C. Turner, secretary. Mr. Wagenhals states that the concern will locate permanently in Detroit, a new location now being sought. It is intended to increase the production of the Wagenhals type of car to 3,000 vehicles for the coming year. The directors are William Pfum, W. G. Wagenhals and C. F. Ayer.

OLDSMOBILE REDUCES PRICES

Lansing, Mich., Sept. 29—Announcement of the new series 54 Oldsmobile features a reduction of \$200 from the list price. At the same time the new product of the Olds Motor Works has a larger motor, the bore and stroke of the cylinders being $4\frac{1}{4}$ and $5\frac{1}{4}$ inches, respectively, an increase of $\frac{1}{8}$ inch in the bore and $\frac{1}{2}$ inch in the stroke. Two chassis models are offered which are the same in every respect except the wheelbase, that of the four and five-passenger car being 132 inches and that of the seven-passenger car being 139 inches. In the former model the five- and the seven-passenger cars both had the same wheel-

base, 135 inches. Tires on the new cars are the same size all round. The new model is lighter and is hung lower.

In external appearance, the new Oldsmobile well might be taken for one of the 1913 models, for there is little to indicate that it is a new vintage. The lines are practically unchanged and still present an unbroken effect, softened slightly by a long, overhanging scuttle and an upward trend at the fronts of the forward doors. The steering column is at the right side and is distinguished by one slight change, in which the worm and wheel mechanism has been replaced by a worm and sleeve device. In the seven-passenger cars the auxiliary seats fold up close to the back of the front seats, where they are quite out of the way, and both models have tonneau electric lights, as well as plug-in trouble lamps.

GERBER BID REJECTED

Detroit, Mich., Sept. 26—At the hearing in the bankruptcy proceedings of the Michigan Motor Car Co., before Judge Sessions in the United States district court at Grand Rapids Wednesday the bid of the Edward F. Gerber Co., of Pittsburgh, former distributor of Michigan cars, was unanimously rejected by the creditors. Gerber's bid, which he later withdrew, was \$350,000 for the remaining assets of the Michigan company. The Detroit Trust Co. was appointed trustee. The hearing was adjourned until October 3 to await further bids. The Michigan concern has about \$150,000 in cash and holds claims of about \$450,000 against the Gerber company.

ASSEMBLY PLANTS FOR CLEVELAND

Cleveland, O., Sept. 27.—A new development in the Cleveland motor car industry is the decision of several of the big Michigan makers to reduce first costs by establishing large assembly plants in Cleveland. Both the Cadillac and Ford people have announced plans for assembly plants in Cleveland. Each company plans to spend a half million dollars in constructing assembly plants.

It is claimed that half the product of Detroit makers is turned out from Cleveland foundries and machine shops, shipped to Detroit, assembled and shipped back east again. To prevent this economic waste is the object of the Cadillac and Ford people.

The Cadillac plans to spend several hundred thousand dollars on its new assembly plant. The Ford Motor Co. has announced a \$500,000 plant to be erected on Euclid avenue, between Eddy road and Lakeview avenue. An eight-story building is contemplated. The Ford company recently leased the Royal Tourist Motor

car Co.'s plant, which it is using as a temporary assembling plant. The new building will be one of the largest factories in Cleveland, 600 feet long and 200 feet wide. From 12,000 to 15,000 cars for the eastern trade will be assembled annually.

THE McFARLAN SITUATION

Connersville, Ind., Sept. 29—That the manufacture and sale of the McFarlan six, and service to owners will be affected in the least by the liquidation of the McFarlan Carriage Co., at Connersville, is denied by A. H. McFarlan, president of the McFarlan Motor Co. today. Already there has been a slight delay in the production of the new models of the car, but they are now being shipped at a rapid rate to the agencies at a distance from the factory, and within 2 weeks will be on exhibition simultaneously in all parts of the country. The personnel of the motor company will undergo no change whatever.

OAKLAND HOLDS CONVENTION

Detroit, Mich., Sept. 30—Nearly every state in the union was represented at the annual convention of Oakland branch managers and distributors, who were the guests of the Oakland Motor Car Co., at Pontiac Friday and Saturday of last week. The two days were spent in an inspection of the factory and the new models; in going over plans for the coming year and in the social activities which go with such occasions. Friday the visitors were conducted on a tour of the Oakland plant. The conference came to a close with a dinner Saturday evening at the Pontchar. The 2 days were spent in an inspection train, Detroit.

SHANKS WITH CLASS JOURNAL CO.

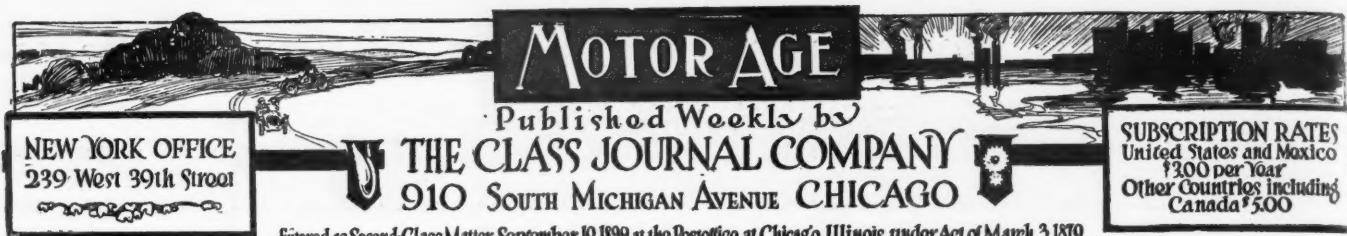
New York, Oct. 1—Charles B. Shanks, who recently resigned as general sales manager of the Kelly-Springfield Motor Truck Co., Springfield, O., has associated himself with the Class Journal Co., publisher of Motor Age and the Automobile. Mr. Shanks will be located in the business department of the New York office.

VICTOR PLANT SOLD

Buffalo, N. Y., Oct. 1—The Clover Leaf Milling Co., of Buffalo, closed a deal today with the assignee of the Victor Motor Truck Co. to secure the large manufacturing plant formerly occupied by the Victor concern at Military and Beaver roads.

FIELD QUITTING JEFFERY

Kenosha, Wis., Oct. 1—H. E. Field, sales manager of the Thomas B. Jeffery Co., has tendered his resignation, effective January 1. Mr. Field will become actively identified with the Kelly-Field Co., of which he was one of the founders.



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Preparing for Winter

JACK FROST has few terrors for those who take the trouble to get ready to welcome him. He may be hailed with delight by the enthusiast who will take advantage of his spare time and money to make arrangements for his reception. When one can put a closed top on a touring car or roadster and turn it into a limousine or coupe, run a pipe from the muffler or radiator to heat the interior, put on tire chains, or non-skid treads to keep from skidding and pour alcohol in the cooling water to keep from cracking the cylinders in freezing weather, most of the old drawbacks to winter driving disappear.

IF for economical or other reasons the motorist is disinclined to be shut up in an inclosed body and prefers to enjoy the exhilaration of driving in the open air, there is no reason for hesitation; if one is afraid of his fingers getting cold he can buy, quite reasonably, a steering wheel or gloves which are electrically heated from a storage battery; there are devices on the market which are miniature hot-water or hot-air heating plants, in which the water from the cooling system in the one case and the hot gases from the exhaust pipe in the other furnish the heat. Or, at less expense, there can be obtained a perforated footboard which, when the rear end of the mud pan is inclosed, throws all the heat of the motor on the feet. So there is no fear of chilly toes. If preferred, lap robes which serve as gloves and overshoes at the same time can be purchased. These cover the feet and pedals and hands and wheel.

WHENEVER anyone attempts to give advice on the subject of winter driving a great deal of stress is laid on a long list of repairing and overhauling that the car must undergo before it is to be considered fit for winter service. Then along toward the end of the instructions one usually finds another list of about the same items that are necessary in the spring. The everyday motorist of ordinary means without a fairly complete repair shop in his garage rarely gets further than to read the instructions when he becomes discouraged and decides he might as well let his car rest over winter and do all the fixing at once in the spring.

NEVERTHELESS, the work required to get the car ready for touring in the winter months is not nearly as formidable as it would seem at first sight. It is simply to see that the motor, body and running gear is in good running condition. If the owner has taken decent care of his charge and has treated it fairly there is very little to be done and nothing that should not be attended to periodically anyway. It is more important, however, that the car be in good order throughout if it is to be used on the road in winter than if it were employed only in moderate weather. Parts are more liable to break in the cold and the shaking up that the car receives over rough, frozen roads or the strains of skidding on slippery streets. Also, it is anything but pleasant to make adjustments or minor repairs on the road in winter time. And such of them as can be accomplished beforehand in a warm garage had better be attended to there for comfort's sake.

TWO of the most important things in preparing the car for the road in cold weather are both for the sake of the motor. The water in the radiator and cylinder jackets and some times the pump is in such thin sheets that very often it

freezes before larger bodies of water would be affected. When water freezes it expands and something must give. Usually it is the radiator or cylinder that is cracked. Alcohol alone or mixed with glycerine is one of the best ingredients to add to the cooling water to keep it from freezing. About 40 per cent of alcohol in the water will prevent its freezing at any temperature above zero. The other cold weather precaution that should not be neglected is to make sure that the motor will get plenty of lubricating oil. Oil becomes thicker when it gets cold and will not feed through the pipes as rapidly as when it is warm.

A GENERAL overhauling is the wisest preparation for winter work and it is safe to assume that the car needs a good cleaning and tightening after a summer's road work. The motorist who has learned from experience will take advantage of this or any other seasonable opportunity that presents itself to lay up his car for a few days for the inspection and partial overhauling that is a wise precaution if the car is to travel winter roads.

Purchasing Power of Roads

THAT motor car manufacturers actually are losing sales and that many car owners are not touring so extensively as they did a couple of years ago has been proven by unsolicited representations to be due solely to the poor condition of the roads, and to the inexplorable neglect to keep improved highways in usable condition. Not a few car owners in a leading city in the central west have delayed the purchasing of cars until they can secure better roads for long distance touring. These people made their initial trips to the White mountains, the Adirondacks, or the Berkshires, 4, 5 and 6 years ago. On one or two successive seasons they made additional trips, but these annual excursions to the eastern vacation fields have been discontinued by motor and are now made by Pullman car, the only excuse offered being the impossible condition of many of the roads.

IT is true that the motorist will tire of road experience. During the first two, or perhaps three, trips the novelty of poor highways have a semi-fascination; but this soon wears out, and when the tourist counts the tire expense of such a trip; when he takes into consideration the mental disturbances that invariably accompany such expeditions; when he takes into consideration the needless rack and ruin to the car; when he finally weighs the needless physical exertion of poor highways, then he finally decides that the experience is scarcely worth while and that he does not enjoy the outing in the mountains or the seashore any better because of the foolish delays caused by bad roads and other touring inconveniences that he is forced to encounter.

THIS is serious. With such a condition as this in front of him it is high time that motor car manufacturers came out from behind their covers and fought openly and stalwartly for improved highways. It is no longer necessary to present to the farmer tabulations showing his annual loss because of bad roads. Today the discriminating motorist is compiling his balance sheet and showing what it actually costs him because of bad roads. He is discovering that he, as well as the farmer, should be commiserated with because of unimproved highways.

Law Makers Compromise on Duty on Motor Cars

Machines Under \$2,000 Value Listed at 30 per cent.

WASHINGTON, D. C., Sept. 29—The conference report on the tariff bill was adopted today by the house and senate conferees. In a brief session, lasting but 7 minutes, a motion to adopt the report, made by Chairman Underwood of the ways and means committee, was passed. The next step after the adoption of the conference report was to report the bill as agreed on to the house. This was done this afternoon.

After the house adopts the report it will be taken up in the senate. It is expected the bill will be adopted by the house on Wednesday and will on that day go to the senate. It is hoped by congressional leaders that the bill can be disposed of by congress and signed by President Wilson by the end of this week. This, however, will depend on the length of the discussion in the senate. However, there is little likelihood of any changes being made from those agreed to in conference.

Here are the net results of the conference on the tariff bill. Among the 676 amendments made in the senate many related merely to verbiage. The house yielded on 427 and the senate abandoned 151. Compromises were effected on 97.

A compromise on motor cars was reached in which those valued at \$2,000 or more take a 45 per cent duty and those valued at less, 30 per cent.

The senate won out in free listing pig iron, ferro manganese, and in free listing iron and steel slabs and blooms and slags.

With the exception of two minor items the reductions made in the senate in the metal schedule were retained.

Round iron or steel wire, covered with cotton, silk or other material, 15 per cent; present law, 20 per cent.

Finished motor cars valued at \$2,000 or over and motor car bodies, 45 per cent; same rate under present law.

Finished motor cars valued at less than \$2,000, finished parts of motor cars, not including tires, 30 per cent; present law, 45 per cent.

Nuts or blank nuts, and washers, 5 per cent; present law, 6 per cent.

Bolts of iron or steel, 10 per cent; present law, 20.59 per cent.

Steel ingots, blooms, slabs, etc., free list; present law, 21.98 per cent.

Aluminum in crude form, 2 cents per pound; present law, 7 cents per pound.

Aluminum in plates, sheet bars, etc., 3½ per cent per pound; present law, 7 cents per pound.

Ferro-manganese, free list; present law, \$2.50 per ton.

All iron in slabs, blooms, loops, etc., less finished than in bars and more advanced than in pig, except castings, free list; present law, \$7.40 per ton.

Steel ingots, cogged ingots, blooms and slabs, die blocks, or blanks and billets, free

list, 50 per cent; present law, 21.98 per cent.

Steel bars, steel castings, etc., all if made by open hearth process, if not containing certain alloys and all steels by what ever process made containing alloys, 12 per cent; present law, 21.98 per cent. The two foregoing paragraphs, when made by the crucible, electric or cementation process, either with or without alloys and all steels by whatever process made containing alloys, 12 per cent.

WILLYS ON EUROPEAN SITUATION

Toledo, O., Sept. 29—Speaking of his observations on his recent European trip, John N. Willys, president of the Overland company, says: "I found business conditions on the whole to be good, particularly in our line of business. But few people over there have any conception of the magnitude of the motor car business in this country. When I spoke of our quantity production and mentioned figures, I frequently got an atmosphere of doubt. This I realize was quite unintentional, and I do not blame the people for it, for when one considers that there is not any one of the factories in any of the old countries turning out more than 7,000 cars per year, it is not difficult to realize that talking in the hundreds of thousands to them sounds like a fairy tale.

"The manufacturers in certain parts of Europe caused me a good deal of amusement. They are waging the most relentless 'knocking' war imaginable, and the lengths they are going to are even more than amusing—they are ludicrous. They do not seem to think their actions and the way they talk distinctly spell one thing—fear. Everything is being done to influence public sentiment against our cars. Such a condition must of course die a natural death.

"On my return I was confronted with the saddest piece of news which perhaps has ever come into my life—the loss of my friend and business associate, George W. Bennett. When I left for Europe early in the year I promoted him to the general management of the Overland business and sailed with confidence in my heart that the task would be well done. It has been. And now when I come back I find him gone to his last rest, but I find too, that I was not mistaken in my judgment, and that he has left everything in such good shape that I can quickly again take the reins.

"At such a time nothing can be said to adequately express one's feelings. We were devoted to each other. I can in a measure fill the gap as far as the business is concerned, but the hard part of it is in not having the pleasure of his charming personality and the benefit of his good sound business judgment. I, like many

others, have lost in him a wonderful friend, and when I say 'friend' I mean it in the fullest sense of the word."

HUB SHOW SITUATION COMPLICATED

Boston, Mass., Sept. 30—The Boston Automobile Dealers Association began this week allotting space for the motor show in Boston next March, and a number of the local dealers and branch managers will have the same spaces they occupied in previous years in Mechanic's building. The action of the accessory manufacturers association in voting not to go into the Boston show is not alarming the directors of the association. The New England show, as the Boston exhibition is called, is a big retail selling affair, and Manager Chester I. Campbell states that for some of the necessary men it is a very profitable one, and that some of these men are protesting the vote to keep out.

The mayor of Boston, the chamber of commerce, and other civic bodies, have been appealed to by the dealers to call attention to the fact that Boston was being discriminated against.

Already one protest has been made. At the meeting of the New England section of the Electric Vehicle Association of America, held last week, resolutions of protest were passed against the action of the Motor Accessory Manufacturers in refusing to exhibit in Boston, and these protests have been sent to the accessory organization. By refusing to exhibit in Boston it will give all the more room for motor cars, so the local men are not worried very much. There has always been a big oversubscribing of space, and many of the dealers who were crowded kicked at the big allotment given to the accessory men.

ARGUE FORD'S INJUNCTION

Buffalo, N. Y., Sept. 30—The suit of the Ford Motor Co., of Detroit, against the International Automobile League, of Buffalo, was up this afternoon in the United States district court on a motion to dismiss the temporary injunction secured against the defendant concern last summer. Argument on this motion occupied Judge John R. Hazel's attention for some time. The Ford company alleged that the Buffalo league advertised to sell four cars at lower rates than the Ford company sold them, thus injuring the business of the Detroit motor firm and at the same time the International Automobile League was not able to make good. The Ford company secured an injunction last year, which prevented the Buffalo league from advertising or selling Ford cars at the rate of three for \$1,000, and the matter now is in court on motion to have the injunction vacated.

American Road Congress at Detroit Attracts Many

Highway Improvement Given Big Boost

DETROIT, Mich., Sept. 30—The third American road congress convened in this city Monday morning with about 4,000 delegates from all parts of the United States and some from Canada in attendance. Ninety-five exhibitors of road machinery, road materials and other products dealing with the making of highways are housed in the Wayne pavilion and adjoining tents. It is the largest and most comprehensive gathering of the kind ever held and indicates the interest of the whole continent in the subject of good roads.

The congress is being held under the auspices of the American Highway Association, the American Automobile Association and the Michigan State Good Roads Association, and besides these three there are twenty-five organizations participating. It is doubtful if any gathering has included more prominent men than the congress now in session. Congressmen, prominent good roads advocates, well known bankers and railroad men are in attendance and among the speakers.

First Day's Session

The first day's sessions were made specially brilliant by the speeches of David F. Houston, secretary of agriculture and A. W. Campbell, deputy minister of railways and canals, Canada, who both stated that their governments were ready to make the wagon roads of today the interior highways of the future.

The introductory preliminaries of the first session were followed by an address by Logan Waller Page, president of the American Highway Association, and director of the United States office of public roads.

"We are entering on a period of road building which has no parallel in all history," said Mr. Page. "It will be greater than that of Napoleon, who gave France her great highway system. Last year there was spent in this country \$200,000,000 for roads. Eight years ago the amount was only \$80,000,000.

Considers Money Well Spent

"I consider that the amount being spent in this country for roads is not a dangerous expenditure. We should see that the money is well spent, and after the roads are laid they be kept in a state of efficiency. Statistics show that the people of the United States spent \$316,000,000 last year in moving picture shows. If, for the gratification of a whim, they can afford to spend this amount without impeding their comfort. I do not believe \$500,000,000 a year too much to be devoted to good roads.

"I cannot too strongly condemn long-term bonds as a means of financing road-building operations. It is almost criminal to issue 50-year bonds for roads that can last only 5 years," said Mr. Page.

A. G. Batchelder, chairman of the ex-

ecutive committee of the American Automobile Association, delivered a forceful argument for good roads.

Laurens Enos, president of the American Automobile Association, was unable to reach Detroit for the opening session but is expected later in the week.

Administration's Policy

Secretary of Agriculture David F. Houston outlined at the Monday afternoon session the course which the United States government under the Wilson administration intends to pursue in the matter of road building. He is heartily in favor of federal aid in road construction and believes the states to be the smallest units with which the national government should deal, leaving it to these states to determine which of the roads within their boundaries should receive aid. Secretary Houston is in favor of the proposed trunk highways, but pointed out that the main issue is to provide efficient means of getting farm products to market.

A. W. Campbell, deputy minister of railways and canals of Canada, stated that his government is working along the same lines as is the United States for the betterment of highways. Mr. Campbell hopes to see the day when the friendly relations between the two lands will be furthered by the establishment of greater vehicular traffic due to international highways of modern construction.

George Diehl Presides

The morning's session of the road congress was under the auspices of the American Automobile Association and owing to the absence of Laurens Enos, president of the A. A. A., George C. Diehl, chairman of the good roads board of the association presided.

Mr. Diehl explained the position of the A. A. A. as being an ardent supporter of any scheme for the betterment of the roads of the country. He explained that there are three proposed methods of federal participation in the construction of highways. These are, first, to distribute the government appropriation throughout every township; second, to have federal aid for the main highways in co-operation with the state units; and third, to have a federal system of trunk lines. The latter plan is advocated by the A. A. A., and Dorsey W. Shackleford, chairman of the committee on public roads of the house of representatives, who is champion of the first plan attacked this scheme of federal aid for trunk highways.

Judge Shackleford stated that there are two classes of people who want better roads. These he styled as the touring roads class whose motto is "See America First," and the business roads class whose slogan is "Cheaper Transportation and Lower Cost of Living." Into the first

contingent he placed the A. A. A., which, he said, aims to promote the pleasure of its members to whom touring roads are a necessity.

"There are 2,250,000 miles of roads in this country. It would cost \$45,000,000 to put them in first class condition. The limit suggested by the A. A. A. is 50,000 miles, leaving 2,200,000 miles unprovided for although those living along these miles would be taxed to help build the 50,000 miles. The A. A. A. estimates that it would take 40 years at \$25,000,000 a year to build these 50,000 miles. We don't want roads 40 years from now; we want them while we live. Don't you see that this national road scheme is a dismal delusion? You want 50,000 miles in 40 years; I want 1,000,000 miles of good business roads to be built in 5 years," said Judge Shackleford.

Against Shackleford Idea

Mr. Diehl couldn't see that the plan was a dismal delusion and wanted to know by what process of mathematics it was figured that if 40 years were required to build 50,000 miles, it would take but 5 years to construct 1,000,000 miles.

Edward H. Butler, newspaper publisher of Buffalo, attacked the Shackleford plan and pointed out that it is poor economy to mend roads at small expense when rains of the following season will reduce them to the same state that they were in before repaired. Lasting roads are needed and these cannot be built for about \$25 per mile as proposed by the Shackleford scheme.

William P. Borland, member of the committee on appropriations of the house of representatives, strongly opposed the "pork-barrel" plan of federal road aid as advocated by Judge Shackleford. He declared that the scheme of local road building which we now have was inherited 150 years ago from England when that nation was a hermit. No other country ever adopted that plan; England dropped it 100 years ago for national road building and we are still using it. He pointed out that while certain districts would not be directly benefited by the development of main trunk highways, it would make transportation costs lower for them since their products could be carried cheaper when they reached these highways. These roads would benefit all and not merely the man whose doors they passed.

Views of C. T. Terry

Charles Thaddeus Terry, chairman of the A. A. A. national legislative board, said that the subject of national aid to good roads has been talked for years. He has heard no one who is not for good roads and federal aid, and thinks it high time that this talk ripened into some concrete thing. It is time for congress to

act; not to argue. Some legislation is better than none, and the view of the majority should be taken. Believing that the plan as proposed in Senator Jonathan Bourne's bill to be the best solution in its general features, Mr. Terry advocates that the public as a whole go to congress and demand its passage.

Terry Offers Resolution

To this end he offered a resolution to the effect that the convention advocate action on the Bourne bill as modified and redrafted by the convention, this action to be taken at the next session of congress in December. The Bourne plan involves a federal road fund of \$1,000,000,000 to be raised by the sale of United States 3 per cent bonds. The proceeds are to be distributed by a United States highway commission on a basis determined by the area, population, assessed valuation and mileage of public highways of the various states. A state may not apply for more than 20 per cent of its proportion in any one year. It must deposit state bonds bearing 4 per cent interest in the United States treasury to cover the amount drawn. These bonds are to be redeemable in 50 years. From the interest received the federal treasury pays the interest on its own threes and has the additional 1 per cent as a sinking fund which is calculated to redeem the state bonds in 50 years.

Mr. Terry's resolution, which was proposed by him personally and not as coming from the A. A. A., was referred to the committee on resolutions consisting of George C. Diehl as chairman and a representative from each of the states in attendance as well as a Canadian representative.

The afternoon session was devoted to state road legislation and management under the auspices of the American Bar Association.

The convention will continue through the week with daily sessions. Thursday will be road users' day under the auspices of the A. A. A. Besides addresses by noted speakers, a discussion on uniform regulations governing the use of vehicles on the highways will be held. Friday's program calls for the sixth annual convention of the Michigan State Good Roads Association, while Saturday will wind up the congress with a general business meeting.

Government Exhibits

In connection with the convention, the government exhibit is of special interest. The office of public roads of the department of agriculture is exhibiting two series of miniature models, one series showing the development of road building from the early Roman roads to the types of road now in use, the other series showing all modern types of road, such as sand-clay gravel, water-bound macadam, bituminous macadam, brick concrete, etc. The exhibit includes models of bridges, culverts and drainage structures, elec-

trically operated models of rollers, crushers, etc. This government exhibit is the most complete and most beautiful road exhibit of its kind ever made.

On Monday night, a reception given by the Detroit board of commerce was followed by a banquet to the distinguished guests of the convention at the Pontchartrain hotel. This function was attended by 400.

MINNEAPOLIS FAVORS GRAVEL ROADS

Minneapolis, Minn., Sept. 27.—The Automobile Club of Minneapolis has gone on record for gravel road building, with careful maintenance, in Hennepin county, of which Minneapolis is the county seat. Several kinds of pavement have been tried for the arterial roads leading to the garden truck and potato districts as well as Lake Minnetonka, a summer resort. The club spends \$5,000 a year itself on roads and signboards and for that reason felt privileged to pass a resolution to the county commissioners to the effect that gravel-clay roads is the solution of the problem locally. To neglect the finished roads for even a short period, the club declares, will result in destruction of the roads and great loss to the county. The club has maintained gravel roads with good effect when properly dragged. The resolution asks the board of tax levy for a liberal appropriation for 1914 good roads work.

WINONA CALLS CONVENTION

Winona, Minn., Sept. 27.—The Association of Commerce has sent out invitations for a black and yellow trail convention for October 6-7, to push the Chicago to Yellowstone Park national road. Delegates will be driven over 8 miles of concrete roads, 8 feet wide with macadam shoulders, which recently have been finished. It will be explained how Winona county proposes to build 95 miles of concrete roads in 3 years, with 16 miles already under contract.

MOTOR WAY FOR TEXAS

Austin, Texas, Sept. 27.—Good progress is being made in carrying to fulfillment one of the most ambitious motor way projects ever attempted in the United States. It involves the construction of a toll highway that is to run from Fort Worth to Del Rio, Texas, a distance of approximately 500 miles. The first 20 miles of the new road has been finished.

The completed section runs out of Glenrose. The motorway is being built by a private corporation called the Texas Motorway Co., which has, it is said, ample financial backing to execute its important plans. As an aid of the enterprise the property holders along the route are required to donate \$2,000 in cash per mile and right of way.

Because of the fact that the route of the highway is through a region of the state that is now lacking in railroad

transportation facilities and that every mile of constructed motorway will add very greatly to the value of the abutting land, no difficulty has been experienced in obtaining this support. It is estimated that the motorway will cost an average of about \$5,000 per mile, or a total of approximately \$2,500,000.

The 20 miles already finished cost approximately \$100,000. The construction material used is crushed stone and cement. The right of way is 100 feet wide. Besides accommodating private motor cars the highway will be used by the company for its own use in operating a regular service of passenger motor buses and freight motor trucks, it is announced. At points on its southern route this motorway will be nearly 100 miles from the nearest railroad. Del Rio is situated on the bank of the Rio Grande about 200 miles west of San Antonio.

TO FOLLOW LINCOLN WAY

Detroit, Mich., Sept. 27.—Probably the first tourist to follow the Lincoln highway across the continent since the announcement of the route a few days ago will be J. Neil Patterson, who starts from San Francisco early in October. Patterson has fitted a special body to his Lozier six, and is making the trip to secure data for a book on motoring. Starting from Tia Juana, a small town just across the Mexican border line in Lower California, the party, consisting of Patterson and two friends, including a photographer, will proceed north to Los Angeles and San Francisco. Here the Lincoln trail has its official beginning, and with the exception of a few side trips the Patterson car will follow the route to New York city.

OHIO FIGHTS WARNE LAW

Columbus, O., Sept. 27.—The legal committee of the Ohio State Automobile Association met at the Columbus Automobile Club rooms recently to outline a plan of action in fighting the new Warnes law, passed by the Ohio legislature which becomes effective January 1, 1914. Suits will be filed to test the constitutionality of the new law and the committee recommends to all motorists of the state that they do not apply for their 1914 license until after the suits are disposed of. The suits will claim that it is really double taxation to pay for registration on the basis of horsepower as the cars are all supposed to be listed for taxation with other personal property of the owner. The committee feels that its contention is a valid one and the courts can be convinced of the injustice of taxing motorists from \$5 to \$18 for the simple process of registering their cars.

MONEY FOR WARREN CREDITORS

Detroit, Mich., Sept. 30.—A dividend of \$50,000 was distributed last week to the creditors of the Warren Motor Car Co. This amounts to 10 per cent.



THE MUSE IS INVOKED

Laurels that Pindar and Homer once wore,
Immortal garlands that graced Shakespeare's brow.
O Muse! Pray surrender, I humbly implore,
For I have a chance to deliver them now.

Bards of the past who were thirsty to sip
Waters inspired from the Pierian springs,
Now through Elysium playfully skip
While gasoline rhymesters sweep the lyre's strings.
The Editor.

MAJOR BURKE, FORMERLY OF THE BUFFALO BILL SHOW, SPEAKS:

LADIES AND GENTLEMEN!
ALLOW ME TO
INTRODUCE MOTOR AGE'S CONGRESS
OF THE ROUGH RIDERS
OF THE WORLD, INTREPID TROUBADOURS
FROM THE PLAINS OF PARNASSUS
IN DARING FEATS OF HORSEMANSHIP ASTRIDE
THE WILD BRONCHO PEGASUS
WHO WILL BE ROPED, THROWN AND
SADDLED
AND THEN MADE TO DRINK FROM THE
GASOLINE TANK.
I THANK YOU!

(There is a fanfare of trumpets, played by Calliope, Clio, Euterpe and Melpomene, as Pegasus is led into the arena by the wraiths of Lord Byron, Edgar Allan Poe, Oscar Wilde, Ralph Waldo Emerson and Percy Bysshe Shelley.)

Some claim the ancient Latin rhymster
Horace,
At writing quatrains still is a la mode—
But take it from me, Abe—and you, too,
Mawruss—
Here is an ode that's certainly some ode.

CRUDE OIL

Within the halls of modern fame
Thy name shall stand serene,
The progress of the age does show
The power of gasoline.

As we approach the close of day,
Thy power once more is seen;
We thank thee for this timely gift,
The light of kerosene.

The world moves on, and yet again
Your glory still relate;
We gladly sing another praise
To you for distillate.

The motors hum along the street,
No matter what the rate
We feel thy presence ever near
Their parts to lubricate.

And now beneath those spinning wheels
Whose strength must bear the load
We needs must think of thee once more
And thine own asphalt road.

So let it be. Thy lessons teach,
Our nobler efforts wake—
The good that we can do to all mankind
And many courses take.

—R. E. Black, Davenport, Ia.

Next read the stanzas of a bard
Who's furthermore a prophet—
He jumps upon the speeder hard,
Condemning him to Tophet.

THE SPEEDER

He scorched when the horse was the victim,
When vogue of the speedway was great,
With a 7-foot rawhide he licked 'im—
He cut them up early and late.
He bowled o'er the young and aging,
Made everyone hop from his way
As he came down the boulevard raging,
For this was his notion of play.

He scorched when the wheel was the fashion,
When the bike it was in its heyday,
For speed was with him still a passion;
He crashed into aught in his way.
He burnt up the sidewalks and byways
'Til the public got sore on him, then
He was driven out into the highways
With the trucks and the mudholes again.

He scorched when the motor came flashing,
He beat it year in and year out,
The result of his much frolic on dashing
Is trouble along every route.
But some day he'll get the last curtain,
Death surely will look in his eyes,
But habit will hold him, that's certain,
He'll scorch even after he dies.

—John P. Brady, Chicago.

Observe the moral that this verse would teach—

For this is Aesop's stuff turned into rhyme—

Or never for the cranking handle reach;

Buy a self-starter, don't be lapped by Time.

CRANKING THE CAR

Jones gave his six-lunged motor car
A drink of gas and a cigar;
Blew up its tires, oiled its joints,
And stroked its fur at many points.
He trimmed its hoofs and reached its hair;
Gave it what carbide he could spare,
Put oil in each empty cup,
And then went round to crank it up.

He stuck one thumb into its flank,
Then seized it rudely by the crank
And, with his right hand, tried to shove
The blamed thing over. Land of love!
First thing he knew he hit the ground
And stars were flying all around.
His arm was cracked when he awoke
And for a while he thought he'd croak.

Amid his awful wails and groans,
The doctor came and set his bones.
Jones couldn't use his car that day
And so his son put it away.
Josh Wise, who saw Jones crack his wing,
Said "Poor Jones now must wear a sling!
If he will use his left hand when
He cranks, he won't get hurt again!"

Howard C. Kegley, Sawtelle, Cal.

Red

Here is a poem for cabaret singers,
One that may make Irv Berlin tear his hair;
It is a parody, also a threnody
Quite syncopated and classed as a "bear."

CASEY JONES IN VERMONT

As the fast express came round the curve
Said Casey Jones, "That gets my nerve!"
For down in the valley 5 miles away
He saw the gleam of a crimson ray.
Was it a signal to stop the train
Or a motor car in the state of Maine?
Said Casey Jones "I'll race that Knight,
He shan't show me his red tail light."
So he opened the throttle good and wide
And all concerned had a very fast ride;
And Casey grinned with a sportsman's pride
As he passed that light on the right hand side.
Then came a crash and a mighty roar
As the fast express through a freight train tore;
As he jumped through the window, Casey said,
"They shouldn't have their tail lights so dog-
goned red!"

So they passed a law to keep from sight
Everything that looked like a red tail light.
The gay young sports of the Green Mountain
state,

Who come in early and stay out late,
And Pilgrim fathers, old and gray,
Missed those lights, it is safe to say.
But Casey Jones when he got out of bed
Said he wished that he was dead,
For the very next time he made a run
He had an experience all men shun.
He rounded a curve in the dead of night
And full in his face gleamed a bright headlight;
Casey jumped and awaited the crash—
Something was wrong for there was no smash!
And Casey cursed and Casey swore
As by him flashed with a pungent roar
A motor car with one headlight
That bored a hole in the black of night.
And Casey said, as he cleaned his coat,
"Those darned motor cars have got my goat;
You can't approach 'em in the rear
And keep your train where the track is clear;
But when you meet 'em face to face—
Lord, loan my soul some saving grace!—
I'll quit this road right here and now,
For headon collisions I won't allow!"
—P. J. Campbell, Georgetown, Ill.

Emporia's proud head hangs in disgrace,
Her native bard has fled to western plain;
Missouri's son leaps to the foremost place
With a prose poem done in Walt's best vein.

THE MOTOR CAR CRAZE

My wife and daughters will run me mad
With this infernal motoring fad. They just re-
turned from town last week where they visited
my sister, Mollie Meck; and all the devilment
they learned there will wreck a home, will
grow gray hair, and cause a man a deal of
woe, for all they think and all they know is
go! go! go!

They hiked around all o'er that town in one
of those reeking gas machines and now they
talk it all the time, my wife she thinks of it
in her dreams.

Last night she imagined she was ready to
go and called out to me to crank the thing.
I said, "Lie still, quit kicking so!" when all
at once the bed did spring. And out she went
right o'er my head and called the girls from
out their bed to get their things and pack
their duds; to town they would go with all my
spuds that I had worked so hard to raise and
swap them off for the going craze.

And while she was cavorting around like
this, I got the hose and let her stizz; I turned
the nozzle open wide; I dampened her clothes,
likewise her hide; when all at once she began
to dance and I knew she then was out her
trance.

And now I've resolved with all my means, if
ever they talk of the darned machines, I'll
drown them all both old and young and live
the life that I begun—a farmer quiet in all
my ways and not go mad o'er the going craze.
—E. A. Shepard, Kansas City, Mo.

With verse quite romantic
This bard, not pedantic,
Makes Walter Scott frantic
By stealing his stuff.
In printing this story
We end our potpourri
In one blaze of glory
'Fore you cry "Enough!"

THE NEW LOCHINVAR

Oh! young Lochinvar is come out of the west;
Through all the wide border his car was the
best;
With horsepower a hundred or more, it was
said,
With wheels painted green and the body bright
red.
He rode all unarmed and he rode all alone,
For champagne and chorus girls carried he
none,
So faithful a lover, with such a great car,
There never was knight like our young Loch-
invar.

He forded Eske river where bridge had washed
out,
He ran over chickens while farmers did shout;
But ere he alighted at Netherby gate,
The bride had consented, the gallant came late;
For a cheap sort of guy with a back-number
car,
Was to wed the fair Ellen of brave Lochinvar.

So boldly he entered the Netherby hall,
Among bridesmen and kinsmen and brothers
and all.
He said: "Passing by in my new model steen,
My tank running low, I must beg gasoline.
In the next town's a show—I've a date with
the star."

He was some fancy liar, this young Lochinvar.
"All set," cried the prompter, "Gents, choose
ye a pard."

Lochinvar sought out Ellen and glanced at her
card.
He marked every two-step and waltz, for a
joke—

The bridegroom, disgusted, went out for a
smoke.

She held out her hands ere her mother could
bar;
"Let's try this new tango," quoth bold Loch-
invar.

One touch to her hand, and one word to her
ear,
When they reached the hall door and his motor
stood near.

So light to the seat the fair lady he swung,
So light to the steering wheel by her he sprung.
He jerked the self-starter, he yanked the brake-
bar,

"They will go some who follow," said brave
Lochinvar.

There was cranking by Graemes of the Netherby
clan;
Forsters, Fenwicks, and Musgraves, they rode
and they ran;
Lord Forster gained fast, with his light run-
about,



But he picked up a thorn and—"Bang!"—what
a blow-out!
Earl Fenwick at 70 miles hourly set sail,
But a constable nabbed him and threw him in
jail.

Lord Musgrave then threw down his two-bit
cigar,
Saying "I'll show you pikers a car what's a
car."

I'll whiz by those lovers like trains past a
tramp.

Where's my blankety blank driver? Here, Peter,
you scamp!"

But Peter had sampled much wedding frappe;
He was down in the barn fast asleep on the
hay.

There was racing and chasing by Cannobie
lake,

But Ellen and lover they did not o'ertake.
She looked back to sigh, and she looked back
to giggle;

He thumbed his brave nose while his fingers
did wiggle.

They reached the next county where ended the
strife,

For a justice of peace made them husband and
wife.

The Netherbies wept and they wailed some-
thing strange,

But folks said, on the sly, they were pleased
with the change.

For the bridesmaids whispered: "'Tis better
by far,

Her complexion looks swell in that cherry-red
car!"

And pa Netherby whispered in ma's happy ear:
"Did you see Lockie take all those hills on high
gear?"

—Sam Slade, Bloomfield, Ia.

L'ENVOI

Who gets the garlands, did you say?
You'd have us sow the dragon's teeth.
We'll pay the space rates and you may
Award the much-priz'd laurel wreath.



The Readers' Clearing House



HOW PACKARD PINION IS FASTENED

Simple Arrangement for Holding Assembly in Place—Differential Adjustment

WILLIAMSBIDGE, NEW YORK—Editor Motor Age—How is the differential adjusted on the 1912 Packard six and also show by diagram if possible how the driving pinion is held in place so that it will not move.—Joseph Vallosio.

The differential of the 1912 Packard is shown in Fig. 3. It will be noted there are two collars or nuts N one on either side of the differential gear. These collars are held in place by set screws and cotter pins. By removing the cotter pin and then loosening the screw it is possible to move the collar. By unscrewing the collar on the left say three turns and then tightening the collar on the right three turns the bevel gear is moved slightly to the left. If one collar is moved the other should be moved the same distance in the opposite direction. Thus by shifting the collars back and forth the driven bevel is moved back and forth. Motor Age advises that, should differential adjustment be necessary, the car should be taken to the Packard service station, where an expert may do the work. The job is not only difficult, but may result disastrously, should the cotter pin holding the collar drop into the gear case.

In Fig. 3 is shown the driving pinion assembly of the Packard six. The retainer or threaded portion T which contains a number of notches is screwed into the differential case at its union with the gear set case. On top of the case there is a hole and one of the notches in the retainer is underneath this hole, when the drive is in position. A plunger is then dropped through the hole and the lower part of the plunger fits into one of the notches. The plunger is then locked.

HIGH GEAR SLIPS OUT OF PLACE

Brief Specifications of the New Buick Six—Speed of 31

Lock Haven, Pa.—Editor Motor Age—I have a 1913 model 31 Buick. What is the actual brake horsepower of this car?

2—What is the speed claimed for it?

3—What are the 1914 specifications of the Buick six?

4—The high gear on my car slips out while coasting over a rough road or after pulling over a grade and then coasting. Why is this?—Samuel Claster.

1—The brake horsepower is 36.

2—With a fair safety factor the maximum speed is 40 miles per hour.

3—The Buick six, known as the model B-55, has a six-cylinder motor of 3¾ inches bore and 5 inches stroke. The valves are in the head. The cylinders are cast in pairs and the motor is claimed to develop 48 horsepower. Cooling is by centrifugal pump and lubrication by circulating splash. The Delco ignition, starting and lighting system is used. The motor drives through a cone clutch to a

Questions Answered and Communications Received.

Joseph Vallosio...Williamsbridge, N. Y.
Samuel Claster...Lock Haven, Pa.
Reader...Benton, Ill.
Subscriber...College Point, L. I.
George Kent...Flushing, L. I.
A. A. Percival...St. Louis, Mo.
O. D. Downs...Port Allegany, Pa.
W. P. N...Neche, N. D.
W. C. Jones...St. Cloud, Minn.
Herman Bernard...Brooklyn, N. Y.
G. M. Hinsey...Yorktown, Texas
Farmer...Towanda, Pa.
Sterling S. Gano...Georgetown, Ky.
Horace H. Kelly...San Diego, Cal.
John Clancy...Sioux Falls, S. D.
F. R. Mansur...Hardin, Mo.

No letter not signed by the reader's full name and address will be answered.

floating rear axle, the intermediate gearing being a 3-speed selective gearset. The wheelbase is 130 inches and the drive left with control levers in the center. Complete details were given in issue of September 25, page 24.

4—The usual cause for the high gear slipping out is caused by a weak spring

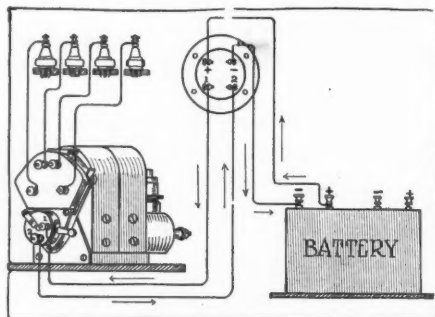


FIG. 1—WIRING OF THE BOSCH DUPLEX SYSTEM

Note that the battery is not grounded and that there is no distributor wire leading out of the magneto. The wires are directly connected

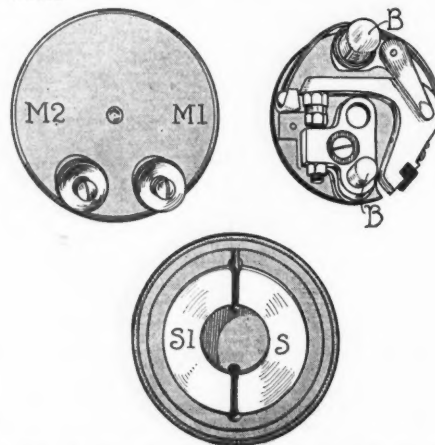


FIG. 2—CHANGING THE BATTERY CURRENT TO PROPER PHASE

The front side of the commutator is shown in the upper left corner and in the center the other side. The segments S and S1 touch the brushes B shown in the interrupter mechanism in the upper right corner

in the plunger of the shifter system. Remove the floorboards. The gearset case is then exposed. Remove the cover from this case. Sit in the seat and look down upon the gearset. Move the shifting lever and note what operates in the gearset. You will notice a part sliding on a rod on the left side of the gearset. Put your hand there and you will feel a set screw on top of that part. Remove the set screw. This will permit of the removal of a spring. Stretch the spring and put the parts back again. The spring, it should be remembered, forces a plunger into a groove in the shifter rod and if the spring is weak the plunger will not hold and the gear will drop out. Push the shifter lever into high gear and listen if the plunger drops into its groove. If a clicking sound is not heard then examine the shifter lever and all its connections, for there may be something which prevents the lever going back all the way. Thus, the plunger will not have a chance to drop into its groove.

BOSCH DUPLEX SYSTEM DESCRIBED

Battery Is Not Grounded—May Start on the Spark

College Point, L. I.—Editor Motor Age—Why does the Splitdorf dual system magneto not have two circuit breakers as in the Bosch dual?

2—Please explain by diagram, if possible, the Bosch duplex ignition system.

3—How are the gears actuated in an electric gearshaft?—Subscriber.

Flushing, L. I.—Editor Motor Age—Why does the Splitdorf dual system magneto not have two circuit breakers?

2—Please explain the Bosch duplex ignition system?

3—How and what makes the gears operate in an electric gearshaft?

4—Are sprockets figured the same way as gears?

5—Please explain the Splitdorf lighting system which is called the Splitdorf life.—George Kent.

1—The design is such that it does not require two breakers. However, the main breaker is part of the magneto, but there is an interrupter in the switch which is used for starting the motor on the spark.

2—The Bosch duplex ignition system is illustrated in Figs. 1, 2 and 4. The system offers a method of obtaining sufficient current at exceedingly low engine speeds to keep the motor operating, and also affords a means of starting the engine on the spark, provided, of course, the engine is otherwise in good condition.

The Bosch duplex system employs a battery, a coil and a high-tension magneto. Current is taken from the battery and led through the coil and thence to the armature winding of the magneto and then back to the battery again. The battery is not grounded. When the magneto interrupter is closed the total current from the battery flows through the coil only. At the instant the interrupter points separate the discharge from the coil is in

the same direction as the current generated in the primary winding of the magneto. The sum of the current of the magneto and battery flowing in the same direction give an intense spark at low engine speeds, at the spark plug terminals.

However, in order that direct current of the battery circuit be kept in phase with the alternating current of the magneto armature the following method is employed. There are two brushes, B in Fig. 2, which are carried on the interrupter and which revolve with it. These brushes bear upon two segments, S and S1, fastened to the commutator, K, in Fig. 4, which is stationary. Now, the current from the magneto armature is of a positive nature at some point. Beginning at this point, the positive lead from the coil is connected to the corresponding segment on the commutator. When the magneto armature moves 180 degrees there is a reversal of the magneto current, as the brush which was previously in contact with the positive segment now bears upon the negative segment of the battery current. In this way the battery current is transformed into alternating current to harmonize with the current of the magneto primary. When the switch is thrown to magneto side the operation is the same as in any high-tension magneto system. That is, the current flowing through the primary induces a high-tension current in the secondary when the interrupter points just separate. This high-tension current is led to the distributor arm and then is sent to the spark plugs in their proper order.

With the Bosch duplex system it is possible to obtain a spark at the plugs when the engine is at a standstill, provided there is enough gas of the proper consistency in the cylinders. The coil of the system is provided with a push button which, when pressed inwardly, actuates a contact maker in the coil itself. This contact maker performs the same functions as the magneto interrupter; that is, it interrupts the primary circuit. The pressing of the button back and forth

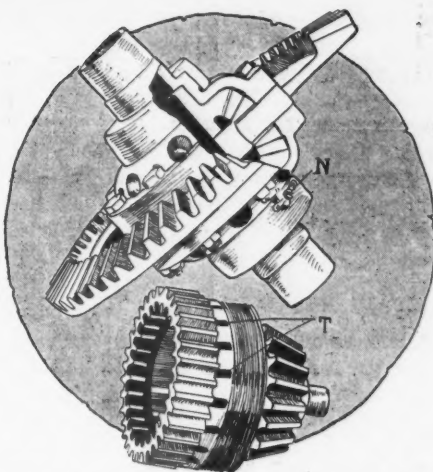


FIG. 3—PACKARD DIFFERENTIAL AND DRIVE

There are two collars N on either side of the differential gear. These collars are used to shift the gear to obtain the proper adjustment. The drive is held in place by a plunger which extends through the case into one of the notches T

permits current from the battery to flow through the primary of the magneto when it is at rest and causes sufficient current to be sent to the plugs to start the motor.

3—The operation of the Vulcan electric gearshift was explained in Motor Age, issue of April 10, page 30.

4—This was described and illustrated in Motor Age, issue of August 21, page 33.

5—Yes; sprockets are figured the same way as gears.

REGAL ROD BEARINGS ADJUSTABLE

Two Crankshaft Bearings Must Be Replaced When Worn

Benton, Ill.—Editor Motor Age—I have a Regal and would like to know what kind of bearings it has. It is a 1912 model T. There is a knock in the motor and I think it is in the bearing. Is there a take-up in them or will I have to get new ones.—Reader.

In the Regal T only the rod bearings are adjustable for they are made in two parts with shims between. The crankshaft is suspended from two bearings and these are made of one-piece babbitt. When they are worn they must be replaced.

WHY CARBON CAUSES MOTOR KNOCK

Pre-Ignition Also a Result of Spark Being Advanced Too Far

St. Louis, Mo.—Editor Motor Age—What causes a gasoline motor to backfire through the carburetor when I cut down on the needle valve, and then when I give it more it runs all right. The motor seems to run all right and all the valves close but when I cut down on the gas it pops back.

2—Kindly explain why the spark controls a carbon knock. For instance, when the motor is carbonized and it is given a hard pull, then advance the spark, the knock is very plain; retard the spark and the knock decreases.—A. A. Percival.

1—By closing the needle valve the mixture is made lean. This mixture burns and the flame is still burning after the exhaust stroke, hence when the intake valve opens the flame will ignite the gas in the intake header and the mixing chamber of the carburetor as well.

2—The carbon knock is caused by pre-ignition. This occurs because the little particles of carbon on the piston and cylinder head become incandescent or red hot, and while in that condition they ignite the gas before it is time. If the piston is travelling upward and an explosion occurs there is a tendency for the piston to go immediately downward. Now the flywheel has momentum and tends to carry the piston over dead center and at the same time the explosion has force and tends to push the piston backward. It is evident that there are two forces acting in opposite directions. The explosion force is less than the force of the piston upward and hence the piston will in its travel slap against the cylinder wall.

An advanced spark occurs when the piston is traveling upward, but it travels so fast that it does not give the spark a chance to explode the gas until it, the piston, has reached dead center. But if the motor is turning over slowly the piston gives the spark a chance to explode the gas, which it does. Hence the same condition will exist as in the carbon knock. That is, an explosion will occur when the piston is going upward, which causes the piston to rock back and forth hitting the wall of the cylinder and causing a knock.

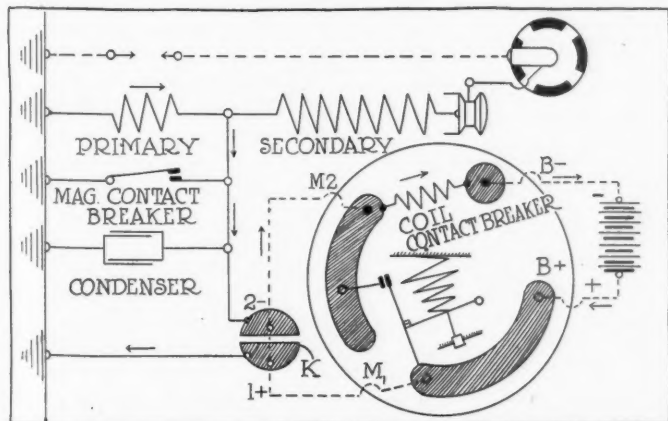
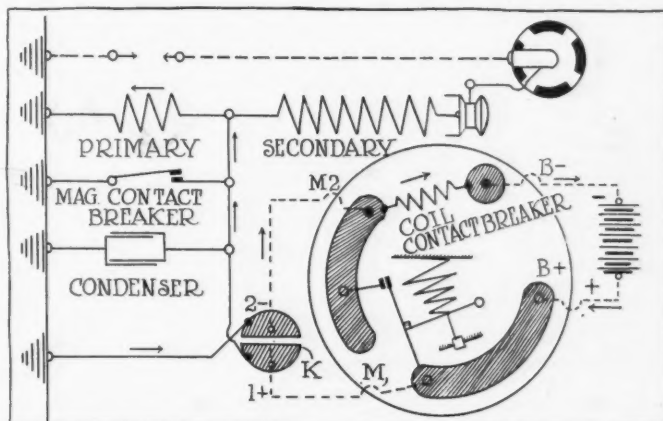


FIG. 4—BATTERY CIRCUIT OF BOSCH DUPLEX SYSTEM

Showing how the battery current is transformed to alternating so that it will be in phase with the current of the magneto primary. When the interrupter shown in Fig. 2 is in one position the current flows as shown at the left but on the next turn the current is reversed as shown by the arrows. The only difference in the two diagrams is the crossing of the wires leading from commutator K. This crossing is made to represent a turn of the interrupter, which carries the two brushes B in Fig. 2



SHIFTER LEVER STICKS IN FIRST Clutch Collar Insufficiently Oiled—Bent Rod or Tube

Port Allegany, Pa.—Editor Motor Age—There is a big seven-passenger Rambler in town that we all find some trouble with in shifting gears. After starting out on low, when one throws out the clutch and tries to shift the gears to second, the lever persists in sticking in low. Should one pull too hard or jerk it, there is danger of its coming out with a jump and flying into reverse, which would be slightly bad for the car. To avoid this difficulty most of us start it in second, and we often have the same trouble in changing from second to high.—O. D. Downs.

To show diagrammatically just why the shifter lever sticks, Motor Age must have the model of Rambler and also the serial number. However, the usual causes of the shifter lever sticking are due to the shifter rod or shifter tube being bent. These members extend inside the gearset case and should either be bent, even slightly, it will be difficult to push the shifter lever into the different speeds. Also insufficient lubrication of the clutch shifter collar may cause sticking, due to the drag on the gears when this condition exists.

MOTOR GIVES WESTERNER TROUBLE

Carburetor Not Adjusted Properly—Rich Mixture for Starting

Neche, N. D.—Editor Motor Age—I have a Metz runabout and sometimes I am able to start it by giving the crank a few turns and at other times the motor will not respond at all, in fact, the job of cranking is often given up. The tappets are all adjusted to 1-64 inch, the compression is good in all four cylinders and there is good suction through the air intake of the carburetor. I think the fault is with the magneto. Can a battery system be installed on this car, which now uses only a magneto? The valves have all been ground and I seem to get a good spark at the plugs.—W. B. N.

If you are getting a good spark at the plugs as you say and the valves are properly adjusted and timed there seems no reason why the carburetor should not be looked to for the cause of the motor's poor performance. In the first place you do not mention the make of carburetor on the car at present, but it would be well in starting the next time to close the primary air intake altogether. At the same time flood the carburetor. This will afford a rich mixture entering the cylinders, which is desirable when starting. Should the motor refuse to start with the 'pri-

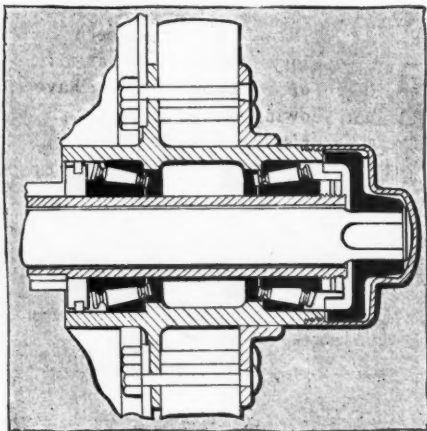


FIG. 5—HOW REAR AXLE OF KISSEL CAR IS FASTENED

mary closed and carburetor flooded try cranking without the carburetor flooded. The whole situation seems to be one of poor carburetor adjustment and Motor Age is sure that if carburetor is properly adjusted and the air is shut off when starting only the motor will start without difficulty. A battery system may be installed on any car, but a timer and coil of some sort is necessary.

REPAIR PARTS FOR OLD COLUMBIA

Has Make and Break Ignition—Wants to Install Bosch Magneto

St. Cloud, Minn.—Editor Motor Age—I have a Columbia, mark 48 and I would like to know where repair parts may be had for same. 2—Will the Bosch DU be large enough for the motor of this car? 3—It is now equipped with make-and-break ignition and a Rayfield carburetor. My difficulty is this. I cleaned the make-and-break points and adjusted the carburetor a few days ago and took the car on the road. I could throttle below 7 miles per hour. A day or so after this performance I drove the car and could not throttle it below 15 miles per hour and then it would backfire. The compression on all cylinders is fine and the ignition system in good order. I cannot see why it will run well one evening and then a few days later not do so well. I have tried it with scant oil and then with excess oil but that does not make any difference. I have cleaned the carburetor and know it is all right.—W. C. Jones.

1—Repair parts for the Columbia car may be obtained from the Newcastle, Ind. plant of the Maxwell Motor Co., also district sales managers in Boston, Minneapolis, New York and Philadelphia.

2—Yes.

3—You do not state what type of Rayfield carburetor is installed in your car, but from your trouble it appears that it is of the two-jet type and that the low and high speed jets are out of adjustment. The method of adjusting the Rayfield carburetor was given in Motor Age issue of July 31, page 31, and if you will follow the instructions given you will find your trouble will vanish.

STEERING POST OF CAR HAS PLAY

Two Methods of Adjustment—Cylinder Heads of Motor Removable

Brooklyn, New York—Editor Motor Age—I have a model S Knox and there is an awful lot of play in the steering somewhere. When I bought the car the man said it could be adjusted somewhere, but I do not see any place for adjusting it.

2—Would it be best to scrape carbon by removing the cylinders or by putting in kerosene or trying this new way of burning it out with gases?

3—When I turn a corner I hear a peculiar creaking sound and sometimes I think that the body is loose on the frame. It sounds the same as the noises heard in a railroad car when it is going.—Herman Bernard.

1—That there is play in the steering mechanism may be due to one or two parts being out of adjustment. It is probable that there is excessive play in the worm of the steering post, and this play may be removed by taking up on the adjusting nut which is shown in Fig. 7 as A. This nut should be given a few turns to the right, looking down from the steering wheel. Should this not take up the desired amount of play the steering connecting rod should be adjusted. The method of doing this is as follows: Referring to Fig. 8, which shows the rod and the ball joint within. There is a slotted nut A in the end of the

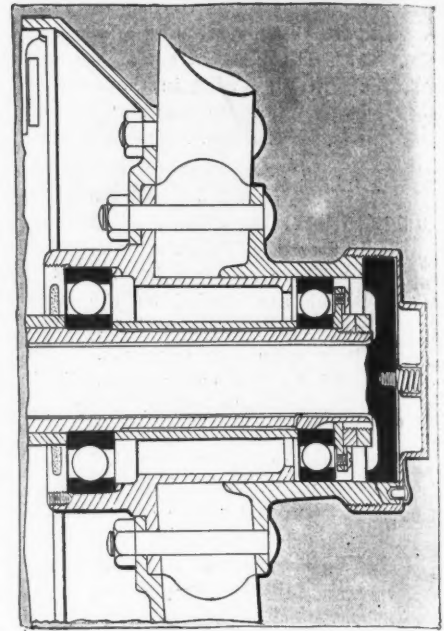


FIG. 6—METHOD OF SECURING PEERLESS REAR AXLE

rod which when turned to the right will take up the play. This nut is removed by first removing the cotter pin C. If there is no tool at hand for turning the nut, it may be pounded around by using a hammer and a drift. Before attempting the replacement of the cotter pin be sure that there is a hole into which it may fit. Try inserting a piece of wire to see that there is sufficient room for the cotter pin. By taking up as much as possible in the steering post itself and in the ball joint in the connecting rod, the greatest amount of play will be removed.

2—With the Knox, it is not necessary to remove the entire cylinder, but if you know your motor, the cylinder heads are removable. With the heads off the pistons are visible. The new method of removing carbon by introducing oxygen into the cylinders has met with success by many and is said to be cheap, efficient and simple.

3—The sound you hear no doubt is due to the wheel spokes being loose. There is little probability of the body fastenings giving way and very often the sound of which you speak may be traced directly to loose wheel spokes. Sometimes this may be remedied by the replacement of one or more spokes and sometimes the entire wheel needs replacement. A good wheelwright could wedge the spoke joints, but such a job is hardly worth while. Motor Age advises that you examine the wheels carefully and note if one is able to move the spokes even a little. There should be no play. If it is found that even one spoke may be shifted slightly place the matter in the hands of a wheelwright.

FASTENING FLOATING REAR AXLE

Usual Method Is By Jaw Clutch—Flange Integral With Shaft

Yorktown, Texas.—Editor Motor Age—Where the housing carries the weight of the car, does an axle, to be the full floating type, have to

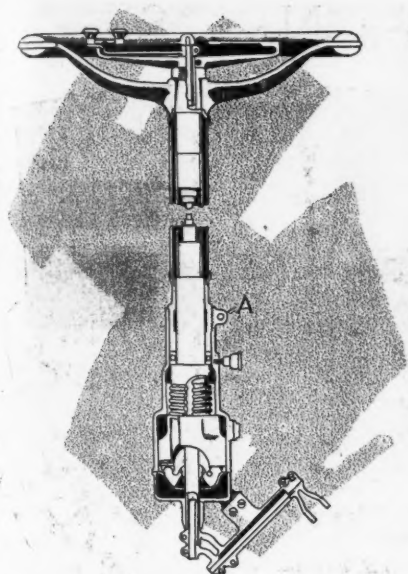


FIG. 7—MEANS OF ADJUSTING KNOX POST BY NUT A

be fastened to the wheel with a hub or clutch or fork, or may it be fastened with a nut plate or flange?—G. M. Hinsey.

A floating rear axle may be fastened to the wheel in any way, but usually the method consists of obtaining rigidity by a dog clutch. In Fig. 6 is shown a cross-sectional diagram of the Peerless floating axle, which employs a dog clutch, which is integral with the axle shaft. The position of the axle bearings is also shown. In Fig. 5 is illustrated the floating axle of the Kissel car, the bearings of which are adjustable. The method of fastening the shaft to the wheel is clearly shown and is of the jaw clutch type. In the Abbott-Detroit the shaft is fitted into the hub flange with a taper held from touring with a key and supported by an outside locking nut to prevent the flange from loosening on the shaft. The flange is fastened to the wheel by bolts which connect the inside hub flange with the outside.

DUTIES OF A FACTORY TESTER

Must Know His Car and Make Adjustments—Maxwell Specifications

Towanda, Pa.—Editor Motor Age—What was the gear ratios of the Stutz in the Elgin race?

2—Does the Regal Motor Car Co. have yearly models?

3—What are the qualifications of a factory tester, and what is the average salary?

4—Would a farmer's boy, who is mechanically inclined and had experience in repairing and driving cars, make good as a tester?

5—Do factories want a tester to drive the cars hard or do they require slow driving?

6—Has the Cadillac Motor Car Co. a school for factory employees?

7—Was the Mercer, driven by DePalma, at Elgin a stock or a special machine?

8—Give a brief description of the Maxwell 6-50.

9—What is Motor Age's opinion of the following specifications of a well-known make of car having a piston displacement of 448 cubic inches: A four-cylinder motor with bore and stroke $4\frac{1}{4}$ by 6 inches, Bosch magneto, Rayfield carburetor, Bougie-Mercedes plugs, 35 by $4\frac{1}{2}$ -inch Braender tires, Michelin racing rims, oil tank capacity 10 gallons, gasoline tank capacity 30 gallons, two extra rims; gear ratios 8 to 1 on first speed, 3.5 to 1 on second, 1 to 1 on direct drive; driving pinion with fifteen teeth, and the differential gear thirty teeth.

10—Would the gear ratio be 2 to 1 with gears as above outlined?—Farmer.

1—Gil Anderson's Stutz had a gear ratio of 2.25 to 1 when it was driven in

the Elgin National trophy race this year.

2—Yes.

3—Car testers at motor car factories are supposed to be men thoroughly acquainted with the car they take on the road. They must be able to ascertain what defects are present in all the parts and then upon their return to the factory with the car these defects must be corrected. The tester must be able to adjust the carburetor, magneto, valves, starter, etc., and in some factories the tester is called upon to decide whether the differential is adjusted properly. Above all, the tester must be able to drive. The salaries of testers vary greatly, but a good average would be 35 cents an hour.

4—All depends upon his showing at the factory.

5—Both. There are so many things which the tester must look for and which require both low and high speed driving and level and hilly work that the driver is called upon to make the test car do every possible stunt to bring out any defects. The tester will take turns slowly then again quickly; he will drive the car through sand, perhaps, and up steep grades to test the motor's pulling power.

6—No.

7—It was a special.

8—The 1913 Maxwell 6-50 has six cylinders of 4 by $4\frac{1}{4}$ inches bore and stroke. Splitdorf dual ignition, pump cooling. The motor drives through a cone clutch to a 3-speed selective gearset and thence to a floating rear axle. The gear ratio is $3\frac{3}{4}$ to 1. Gray & Davis starting and lighting system is used. The wheelbase of the car is 130 inches and the tires 36 by $4\frac{1}{2}$ all around.

9—The specifications are good.

10—No. The gear ratio is the ratio of the motor speed to the wheel speed. That is, when the ratio is 2 to 1 it means that for every revolution of the wheels there are two revolutions of the motor. A 3 to 1 ratio would mean that the motor turns over three times to one of the wheels. The ratio between pinion and bevel in your case is, as 1 is to 2.

WANTS DIRT RECORDS TABULATED

Maximum Speed of Chalmers 36 is 50 Miles Per Hour

Georgetown, Ky.—Editor Motor Age—What is the maximum speed of the Chalmers 36 touring car?

2—Will Motor Age explain the dirt track records of America in the same form as was published in the speedway records, in the issue of May 29, 1913?—Sterling S. Gano.

1—About 50 miles per hour.

2—Motor Age has no intention of publishing a table of the dirt track records.

Users of Electric Gearshift

San Diego, Cal.—Editor Motor Age—How many cars are now using the electric gearshift, and what are they?—Horace H. Kelly.

The following five makes will on 1914 models use the electric gearshift: Pilot, Haynes, Norwalk, S. G. V. and Pullman. The S. G. V. car was the first to announce the installation on 1913 models and was followed by the Norwalk and Haynes.

WANTS TO TUNE MOTOR FOR RACING

Retime the Valves and Magneto—New Pistons and Rings Needed

Sioux Falls, S. D.—Editor Motor Age—Is it possible to make a racing motor out of a 50-60-horsepower motor with a bore and stroke of $4\frac{1}{4}$ by $5\frac{1}{4}$ inches? If so, how and what change will be necessary?

2—Is there any other method of fixing an exhaust pipe on a motor instead of on the side?

3—What springs are best adapted for racing machines?

4—What is the approximate horsepower of a motor with 301 cubic inches piston displacement and with 451 cubic inches?

5—What make of motor does the average racer use?—John Clancy.

1—The motor of which you speak may be tuned up for racing by fitting new piston rings and possibly new pistons should the latter be worn too much; by lapping in the pistons; by retiming, setting the magneto at a little greater advance, by making the intake valves open earlier and the exhaust a little later than at present, by substituting a larger carburetor for the one now installed.

2—Your question is not quite clear. The exhaust pipe of a motor must run from the exhaust valve side to the muffler, if there is one, so it remains that there must be an exhaust pipe or part of it at the side, unless exhaust valves are in the cylinder head. In some racing engines the pipe is extended over the top of the motor.

3—Any type but elliptic seems to do the work well. If elliptic are used it would be found that there is too much side sway.

4—This cannot be stated definitely as there are so many other factors in the determination of the horsepower of a motor aside from displacement. Two motors of the same displacement do not necessarily give the same horsepower. A good average, however, would be 35 horsepower for the 301 cubic inch motor and 53 for the 451 cubic inch motor.

5—No record has ever been taken of the makes of motors used in racing cars, but it may be said that most of them are special engines built for racing by some motor manufacturing concern.

Speed of Little Four

Hardin, Mo.—Editor Motor Age—The question has come up as to the speed of the Little four. What is the fastest record made by this car?—F. R. Mansur.

The Little four has never been entered by the factory in a race, but it is stated that some of the factory testers have had the car showing 50 miles per hour. The average car's speed is about 30 miles per hour.

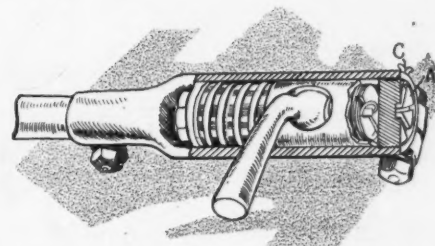


FIG. 8—REMOVING PLAY FROM STEERING MECHANISM

Paige-Detroit Product Refined for New Season

No Radical Changes in Construction of Two Models Which Form 1914 Line—Price Reduction

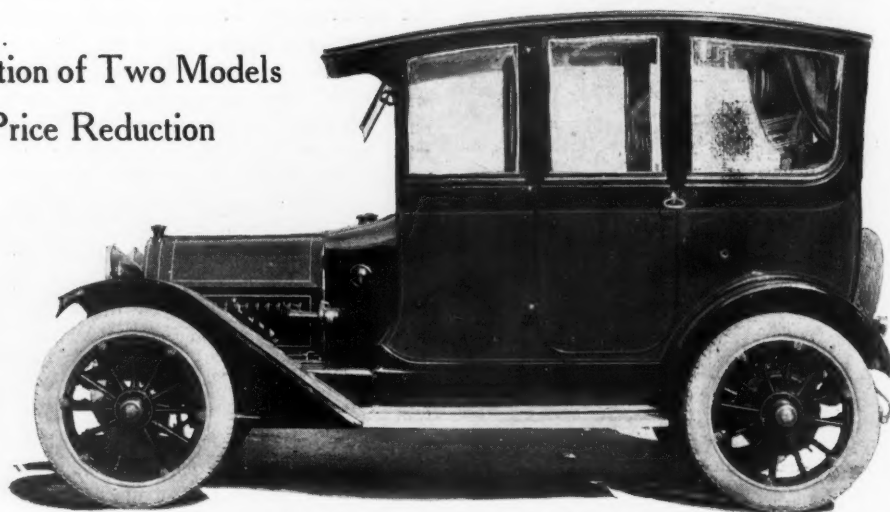
THE same two models represent the Paige-Detroit Motor Car Co. for 1914 as were marketed during the past year. These are models 36 and 25, and in most respects they are the same in design and construction as heretofore. The price of the larger car remains at \$1,275, which includes electric cranking and lighting, but the model 25 was reduced in price on Sept. 20 to \$975 with full electric equipment. Its former figure was \$950 exclusive of electric lighting and cranking, \$75 additional being asked for these features. Hence the new price really means a reduction of \$50.

Both models have four-cylinder motors and unit power plants, but in most respects they differ widely mechanically and in general appearance. The larger model is fitted with two open and two closed body types, the former being a roomy touring car and a roadster, while the latter comprise a coupe and a sedan, both of which are built along most attractive lines. The model 25 carries roadster and touring car bodies only.

Paige Model 36

Model 36 motor is of the L-head type, with the gearset bolted to integral arms of the crankcase which pass around the uninclosed flywheel in yoke fashion. This construction makes a unit power plant arrangement, both front and rear of the engine unit being supported on frame cross members.

The cylinders, which are block cast, have a diameter of 4 inches and a stroke of 5 inches. This gives a stroke-bore ratio of 1.25 and a piston displacement



NEW PAIGE 36 INCLOSED BODY

of 251.2 cubic inches. Valves are on the left, while all of the electric equipment together with the centrifugal water pump are carried on the right side.

The crankshaft has three main bearings and an integral flange at the rear to which a 16-inch flywheel bolts. End thrust is provided against by two large flanges of $\frac{7}{8}$ -inch face at either end of the rear bearing. The camshaft carries, in addition to the cams, an eccentric to operate the plunger oil pump. Hardened and ground tappets of the mushroom type and provided with an adjustment are used for opening the valves. These tappets are off-set in the direction of rotation of the cams.

A feature of this Paige power plant is the silent chain drive for the camshaft, magneto shaft and generator. On the front end of the crankshaft are two sprockets which are used in connection with Link-Belt chains. One chain connects with the camshaft sprocket on the left, while the other runs to a sprocket on the right for operating the pump and magneto. For driving the generator, a third chain runs from this pump shaft down to the electrical unit's shaft. These driving chains are all completely inclosed in aluminum housings.

Lubrication of Motor

Lubrication of this motor is of the combination force feed and splash type having an eccentric-operated plunger pump distributing the lubricant from an 8-quart sump in the bottom of the crankcase. The pump forces the oil into a tube that is cast the length of the crankcase. This tube has four tiny holes, one leading to the chain case and one to each of the crankshaft bearings. A pocket which the tube keeps filled with oil is cast on top of each bearing. At the bottom of the pocket is a hole which drains the oil down into the bearing proper, the surplus oil overflowing into the crankcase, where it is maintained at a con-

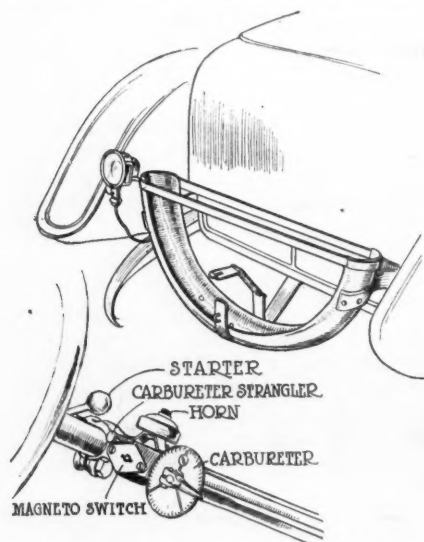
stant level by two overflow outlets which return the oil to the reservoir. An overflow hole in the front wall of the crankcase keeps the oil in the chain compartment at such a depth that the chains are running through it at all times. The supply hole is so located that when the car is running down hill, none of the oil in the crankcase will run out into the chain case. Scoops are fitted on the connecting rods to splash the oil into the cylinders or into the connecting rod bearings. The oil is strained before it is recirculated.

The Electric System

Considering the ignition, lighting and cranking apparatus as a whole, it may be regarded as a three-unit construction, since magneto, cranking motor and generator are each separate. The ignition equipment is entirely independent of the other two units, the Bosch magneto being mounted on a bracket on the right side of the engine and driven through a flexible coupling at the end of the pump shaft.

The generator, the chain drive of which already has been mentioned, is also on the right side and forward. It is geared 3 to 1, that is, it revolves three times as fast as the crankshaft. The cranking motor, which is fastened in the right arm of the crankcase passing around the flywheel, indirectly drives a large gear affixed to the flywheel. A pinion on the armature shaft of the motor gears to a lay shaft on the opposite end of which is another pinion which slides into mesh with the flywheel gear when starting the engine. The gear reduction between the motor and engine is 15.23 to 1.

The lighting and starting equipment is a Gray and Davis set and in connection with it there is a Willard storage battery. The generator furnishes the current for the lights and charges the storage battery. This unit in turn gives out its energy for operating the cranking mo-



ABOVE, SPARE TIRE RACK ON PAIGE 36
BELOW, CENTRALIZATION OF CONTROL

tor and for lighting purposes when the generator is not running at night. The generator gives its full voltage at any car speed above 10 miles per hour, and being provided with a centrifugal governor, its speed is kept constant regardless of the car speed.

The cranking motor is provided with an overrunning clutch which prevents the gasoline engine from driving the motor when the former starts up. The motor weighs about 40 pounds. Both this unit and the generator operate at 6 volts. As in usual practice with flywheel-g geared cranking motors, it is provided with a two-point switch, the first point permitting only a small current to reach the electric motor due to passing this current through a resistance. This turns the gears slowly and permits them to mesh easily. The second switch point sends the full current to the motor so as to spin the crankshaft. The cranking motor draws current at the rate of from 80 to 120 amperes under normal conditions. These figures are only approximate, however. To operate the cranker, a lever on the steering column is first thrown over, after which the clutch pedal is pressed.

The Transmission of Power

The clutch is of multiple-disk type running in oil, and is composed of seven stamped driving disks, $9\frac{1}{2}$ inches in diameter, each disk having 36 perforations into which cork inserts are forced, and seven tempered saw-steel driven disks driving a spider which is connected with the gearset. The driving disks are connected by tongues to the fly-wheel. The clutch is held in engagement by a single non-adjustable spring wound from $\frac{1}{4}$ -inch square spring steel. The load from this spring is taken up by a large ball thrust bearing. The clutch spindle is carried on two roller bearings.

The gearset which, along with the clutch, is in unit with the motor, is of the selective type with three forward speeds. All gears and shafts are constructed of nickle steel.

From the motor unit, the power is carried back to the rear axle by a propeller shaft enclosed in a torsion tube. The rear axle is three-quarter floating with the conventional type of bevel driving gears and differential. Radius rods with ball ends run from the ends of the axle to

the rear end of the gear case and take the driving strain from the springs. The single universal joint is located at the forward end of the drive shaft and is fully enclosed so as to run in oil.

Brakes are of the ordinary external contracting and internal expanding variety and afford a large braking surface, due to a drum diameter of 14 inches and width of 2 inches. The rear wheels are rigidly attached to the drums and carry 34 by 4-inch tires on demountable rims. Spring suspension of the model 36 is by means of semi-elliptic front springs and elliptic rear springs. The latter are underslung from the rear axle in accordance with a growing tendency among American cars. It allows the chassis to be hung lower without affecting the road clearance. These rear springs have scroll rear ends. The front pair are 36 inches long, while the rear measure 38 inches. The width of both sets is 2 inches.

Paige 36 drive is on the left with control levers in the center. Gear changes are effected by a ball pivoted rod, the socket being in the same casting that is used for the gearbox cover. The gear-shift rods and forks and change-speed hand lever are all assembled with the gear box lid, making a very compact unit construction. The spark and throttle levers are located on top of the steering wheel, while both clutch and brake pedals are fitted with adjustable pads to suit the requirements of both the tall and the short driver.

Paige 36 Bodies

Both the open bodies fitted to the model 36 chassis have very wide doors, the front being 19 inches and the rear 21 inches in width. The front doors are hinged in the rear and are provided with an adjustable latch, by means of which they may be held open slightly to allow ventilation of the front compartment. The electric side lights are of frosted cut glass and set flush with the dash. Behind the gasoline tank, which is under the cowl, is a modern dash board on which the various switches and indicators are conveniently placed, with the most important on the drive side. The fenders are up to the minute and have webs running down to the frame. The rear fenders follow the curve of the wheels. The equipment is complete in every respect.



FORWARD COMPARTMENT SHOWING DEPTH OF UPHOLSTERY. ADJUSTMENT OF PAIGE PEDALS

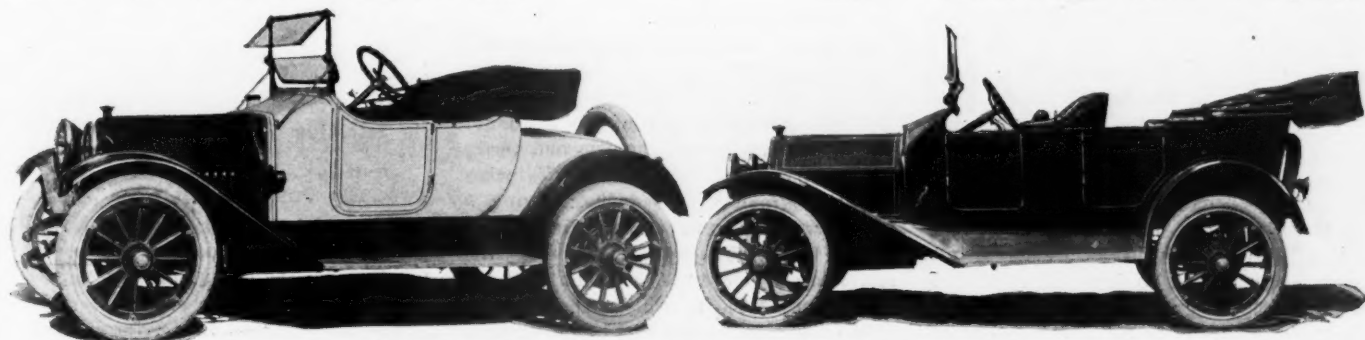
Like the model 36, the 25 has a unit constructed power plant, although the design of this smaller motor is radically different from its larger brother. With a bore of $3\frac{3}{4}$ inches and a stroke of 4 inches the motor develops normally about 25 horsepower. The cylinders are of the L-head type, block cast. A unique feature of this power plant is the placing of the flywheel at the forward end, uninclosed; the inlet and exhaust manifolds on the left side are cast integrally with the cylinders, there being only one external connection to the carburetor pipe and to the exhaust pipe respectively.

Motor Details of 25

The crankshaft, which is drop forged and heat treated, runs on two solid die-cast bearings of white bronze, the front bearing being 4 inches long and the rear $3\frac{1}{2}$. The drop forged connecting rods are of conventional type and have a length of $8\frac{1}{4}$ inches. Valves, the tappets and spring mechanisms of which are inclosed by removable cover plates, have a diameter of $1\frac{1}{8}$ -inch. Their heads are of cast iron, welded to carbon-steel stems.

A feature of the Paige 25 motor is the accessibility of the reciprocating parts, on either side of the crankcase, there being large removable plates for the purpose. There are two of these plates to each side, held by six bolts each.

Lubrication is provided for by a constant level splash system with a plunger



PAIGE 36 ROADSTER AND THE MODEL 25 TOURING CAR FOR 1914

pump supplying the splash troughs and bearings from a 4-quart reservoir at the bottom of the motor. This pump is operated by an eccentric on the camshaft. Unlike the larger motor, the model 25 engine is cooled by thermosyphon.

Ignition is provided by a Bosch magneto located on the left side of the motor back of the carbureter, and driven by inclosed gearing from the camshaft. This ignition system is separate from the electric cranking and lighting system which is of the Disco make. The generator and cranking motor are separate units and are mounted at the front of the engine on the left side, this position of the electric motor being necessary so that its gearing can mesh with teeth cut in the outer rim of the flywheel. The generator is mounted on a bracket above the electric motor and is driven by the same belt which drives the cooling fan, an idler pulley being

used to adjust the belt tension. This electric system, like the other types, operates in connection with a storage battery, the generator charging this battery, which later gives out its current for driving the cranking motor and for lighting the lights when the engine is not running at night.

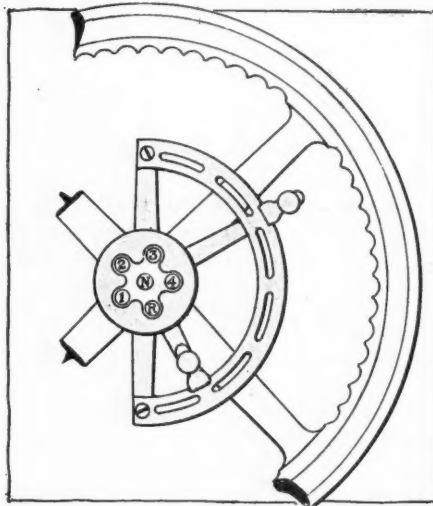
The clutch is of the same type as that used on the larger car, and the gearset, which bolts to the rear of the transmission case, through a flange, is of the same general construction also. The rear axle is semi-floating with a malleable-steel housing, heavily ribbed, and double-trussed. In this chassis also, the power is carried back to the rear axle through an inclosed drive shaft fitted with a universal joint at its forward end. The brakes operate conventionally on drums measuring 10 inches by 2 inches.

Although the front spring suspension

is of the standard semi-elliptic type, the rear springing is unusual, in that a single elliptic spring, mounted cross-wise, on the rear-axle housing, supports the rear of the car. This spring is unusually large, having a length of 36 inches and a width of 2 inches. The front springs are 24 $\frac{1}{2}$ inches long and have a leaf width of 1 $\frac{3}{4}$ inches. This method of spring construction gives the chassis a three-point suspension, which is a very desirable feature.

Drive and control of this car are on the right, and, also differing from model 36, the gasoline tank on the touring car model is located under the front seat, while the roadster carries this tank at the rear of the seat, gravity feed being used. This model has a wheelbase of 110 inches and its equipment is complete, including demountable rims with one extra rim.

Pullman Offers New Light Six of Refined Body Lines



PULLMAN STEERING WHEEL WITH GEAR-SHIFT CONTROL BUTTONS IN CENTER

PULLMAN offerings for 1914 are featured by a new light six of exceptionally pleasing body lines, a single-bow top for one-man operation, wire wheels and electric gearshift, known as the 6-46. The line as a whole for the new season includes four chassis models. For 1914 the Pullman cars will be made in four chassis models. Two of these incorporate four-cylinder motors and two have six-cylinder motors. The 6-46 is the only model which has been added to the line but the others have all been extensively improved.

Improvements in Old Models

Improvements in the actual construction work on the three standing models which are known respectively as the 4-36, 4-44 and 6-66 include a new piston which is fitted with an oil groove pierced by small holes to prevent an excess of oil from being sucked up into the cylinders. Another improved feature in the oiling system is a micrometric oil level adjustment on motor.

Vulcan Electric Gearshift, Wire Wheels and Quick-Acting Top Among Features

Refinements which are embodied in the entire 1914 line embrace the following: Pressed steel torque connection on rear axle, Westinghouse starter, dog clutch for direct drive in gearset, removable gasoline tank, safety link on rear shackle to prevent springs turning over, reserve feature in gasoline tank, ventilated hood, lower cowl, boots on tie rods and torque barrels. The body work has been beautified by making a rounded instead of a straight back and the windshield is now integral with the instrument board on the cowl. Wire wheels are furnished at \$50 extra on the 4-36, \$60 on the 4-44 and \$75 on 6-66.

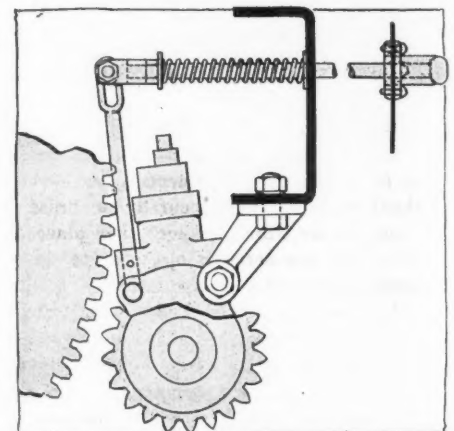
Besides these refinements there are incorporated in the 6-66 a gear-driven tire pump, 37 by 5 inch tires, special tool equipment and tonneau lamp.

Features of New Six

The new six is built generally along the light six lines which have come into vogue in the past year. It embodies advanced design straight through from the small six engine to the electric gearshift and streamline type of body.

The motor used in this car weighs 600 pounds, including the flywheel and regular equipment. It is of the six-cylinder L-head type and forms a unit power plant with inclosed valve mechanism and three-point suspension. The bore is 3.75 inches and the stroke is 5.25 inches, giving a horsepower rating of 34 according to the S. A. E. formula. On block tests the motor has developed 38 horsepower at approximately 1,500 revolutions per minute.

The six-cylinders are cast in threes from close-grained gray iron which has been



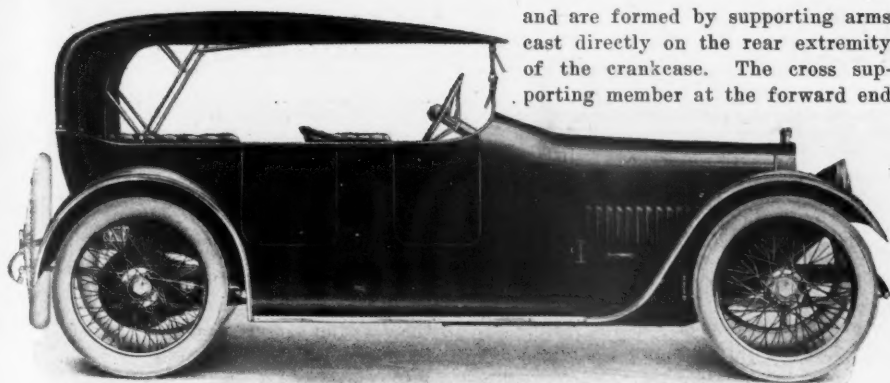
ATTACHMENT OF TIRE PUMP TO ENGINE OF NEW PULLMAN 6-46

aged after the rough boring process to eliminate casting distortions. The cylinder base flange is broad and forms the bases of the guides for the valve lifters. This construction allows for the cover plates which inclose the valves. There are two of these plates, each extending over a block of three cylinders.

The waterjackets are cast integrally with the cylinders but have their covers cast separately. The interior of the waterjackets are given a sand-blast finish and then scraped. Before and after the final machining on the cylinders the jackets are given a water test to detect leakage through cracks or blow holes. The water-jacket cover can be removed by taking out the retaining screws on top of the cylinder.

Two-Piece Crankcase

The crankcase is made of two pieces and the material is aluminum alloy. All the bearings for the crankshaft are carried in the upper half of the crankcase and the lower half contains the oil reservoir and can be removed when it is necessary to



GRACEFUL LINES OF NEW PULLMAN 6-46 FOR 1914

adjust crankshaft and connecting rod bearings.

Valves are mounted on the right side of the motor and are operated by a single camshaft having the cams integral. The inlet and exhaust valves are interchangeable and have nickel steel heads mounted on carbon steel stems.

The timing gears have helical pitch and are three in number, the set composing one crank, one cam and one magneto gear. They are housed in an oil-proof gearcase on the front of the motor.

The bearings for the crankshaft, camshaft and connecting rods are lined with nickel babbitt and the connecting rod and camshaft bearings are secured by brass retaining screws which are locked in place. The bearings are scraped by hand to fit. The connecting rod bearing adjustment is made by a series of punched steel shims varying in thickness. The shims extend into the space between the upper and lower bearings.

The flywheel is 15 inches in diameter and is held to the crankshaft by six large steel bolts. It is made of cast iron and after being turned is balanced on a running balance machine.

Pullman Oiling

Lubrication is a combination force feed and splash with a constant level. The oil is circulated by pumping it through a gear pump with a gallon a minute capacity directly to the main bearings. The overflow from these bearings goes into the splash troughs and also into oil pockets which are designed to feed the lubricant to the timing gears and the silent chain which provides the generator drive.

A multiple-disk clutch is used on this car. It is composed of twenty-one disks, the alternate faces being covered with raybestos. The tension is provided by two independent clutch springs. This clutch is housed directly with the flywheel and the housing is carried back to include the gearbox, thus providing the unit power plant.

Three-point suspension is provided by a cross-member which furnishes the single point at the forward end and which is provided with a pivot bearing containing a bronze bushing and oiler. The other two points are at the rear of the motor

and are formed by supporting arms cast directly on the rear extremity of the crankcase. The cross supporting member at the forward end

is of channel section and the oiler consists of an oil cup mounted above the pivot support.

Electrical equipment of the car divides itself into four separate and independent systems for lighting, starting, ignition and gearshifting. Lighting is taken care of by a Westinghouse six-volt generator connected with a storage battery. The generator starts charging the battery at car speeds of approximately 10 miles an hour and above. The generator is of the low-speed type turning at one and one-half times crankshaft speed. The generator output is controlled inherently by using a compound differential winding and a reverse current cutout prevents the battery from discharging through the generator when the car is at rest. The headlights can be dimmed for city driving.

The electric cranking motor is an independent unit taking its current from the battery. It operates at 6 volts and is geared directly to the flywheel. The gears on the flywheel are cut directly in the iron wheel and are not only utilized for cranking but also serve as a driving medium for the tire pump which can be swung into action by a lever on the dash, as shown in the illustration. It can inflate to 90 pounds in 3 minutes.

Vulcan Electric Gearshift

Gearshifting is accomplished by the Vulcan electric device which operates with current taken from the battery. The gearshifting is controlled by a series of buttons located on the end of the steering column which are so arranged that they do not turn with the wheel but are always in the same position. There are five of these buttons in a circle and one button in the center of the circle. The button in the center throws the gears into neutral while the others are for the first, second, third, fourth and reverse speeds. The shifting is done by pressing the desired button down and then depressing the clutch pedal and allowing it to return to its ordinary position. The battery current acts on a series of powerful solenoid coils in performing the work of gearshifting.

The control features are all on the left side of the car and the emergency brake lever is mounted to the right of the

driver's seat or in the center of the car. The dash equipment is carried on a cowl board and the gasoline tank of 20 gallons capacity is mounted in the cowl. The carburetor adjustment is mounted within easy reach of the driver, who has full control over all adjustments without having to leave his seat. The speedometer has its dial flush with the cowl board. The service brake is fitted with an independent equalizer.

The running gear of this car has been designed to be as easy as possible. The springs are of extra length, measuring 60 inches with nine leaves in back and 40 inches with nine leaves in front. Mott wire wheels are used all around and the deep upholstery helps take the road shocks away from the passengers. A spare wire wheel is carried on a false hub at the rear of the car and is furnished as part of the regular equipment.

Features of Equipment

In the accessory line this car is well equipped. The top has but a single bow, giving great speed in putting up or taking down and the side curtains are carried rolled up inside the top so that it is unnecessary to get out of the car in order to put them up. An electric horn goes with the car and 36 by 4-inch tires are used all around. The wheelbase is 130 inches.

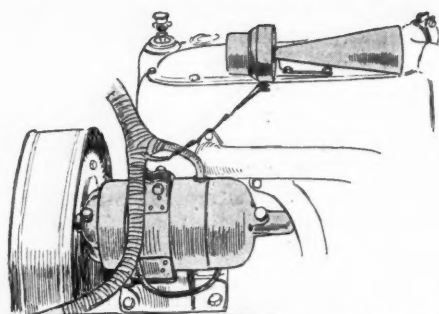
Throughout this new car the ever improving work at the Pullman factory may be noted. The grinding work is all done to .00025 inch, machine work is limited to .001 inch and all through the car the limits are small and the factor of safety as high as permissible. The frame is designed to carry 1,000 pounds more than the probable weight with full passenger load.

KISSEL MAKING A FOUR

Although it is an advocate of the six-cylinder, the Kissel Motor Car Co. has not abandoned the four-cylinder field, as announced in *Motor Age* September 18. The 40-horsepower four-cylinder model is one of the 1914 offerings and the company reports a large demand for it.

NATIONAL RE-ELECTS OLD OFFICERS

Indianapolis, Ind., Sept. 27—At the meeting of the stockholders of the National Motor Vehicle Co., the officials of the company reported that the fiscal year closing September 1 was the best both in sales and profits in this company's 14 years of manufacturing. So flattering was the report that the stockholders expressed their extreme pleasure by expressing a resolution of thanks and congratulation for the officials because of their excellent showing. Directors were elected as follows: A. C. Newby, Robert Martindale, P. E. Manchester, William Guy Wall and George M. Dickson, being a re-election of last year's directors. Last year's officers were also re-elected: President, A. C. Newby; vice-president, William Guy Wall, and secretary and treasurer, George M. Dickson, the general manager of the company.



ATTACHMENT OF CRANKING MOTOR AND MOUNTING OF HORN

REGALS of the new series still make good use of the underslung construction for three of the four body types offered, while the one overhung model is retained in touring car type. The underslung types are known as models T, N and NC, these designations referring to the touring car, roadster and coupe models, respectively, but the chassis is the same for all and has a wheelbase of 108 inches. The overhung model is indicated as model C and retains its wheelbase of 116 inches.

There are several changes, both mechanically and in the bodies of the new Regals. The principal ones are the shifting from right drive and control to left drive and centrally located levers on both new chassis, the addition of electric cranking and lighting, the underslinging of the springs all around on the overhung model, a refinement of the clutch-operating yoke on the model T chassis, the elimination of side lamps and the alterations in the body designs to bring them up to the latest dictates of fashion.

Motors of Regal Underslung

Underslung models have a four-cylinder, block-cast, L-head type of motor. The valves are on the left, and, with cylinder dimensions of $3\frac{3}{4}$ inches by $4\frac{1}{2}$ inches bore and stroke, respectively, this engine develops from 25 to 28 horsepower. The general construction of this motor is much the same as that adhered to in the usual well-designed motor of this size. There are four points of support by means of arms cast integral with the crankcase. These rest upon a sub-frame consisting of two tubular bars running lengthwise and parallel to the main frame rails. These supports are carried at either end upon frame cross members, one amidships and the other just back of the radiator.

The crankcase is of the barrel type, the two crankshaft bearings being of the cylindrical type and mounted in the ends of the crankcase. The bottom of this case is removable, being bolted in position. It forms the oil reservoir. To remove the crankshaft with this construction, after the timing gear has been removed, the front bearing housing may then be taken off and the shaft slipped through the opening thus made in the front of the crankcase. The camshaft of this motor has two bearings and is drop-forged of special steel with integral cams and pump eccentric.

Regal Adds Electric Cranking System

Left Drive and Center Control Among 1914 Changes

The connecting rods are of the usual I-beam type having four-bolted lower ends. The pistons are of gray iron and equipped with three eccentric diagonally-split rings each. Inlet and exhaust manifolds are removable with this motor. The exhaust manifold is placed on the valve side, while the carburetor is located on the opposite side. The intake pipe connects to the cylinder casting on this side also, the passages to the various cylinders being within the casting itself, passing through the water jacket space to the opposite or valve side. This feature has the advantage of aiding the vaporization of the fuel in the warm jacket spaces with consequent better combustion. The carburetor is a Schebler.

Double Radiator Connections

Due to the thermo-syphon cooling, the water inlet and exhaust pipes are of large size, so as not to interfere with the flow. The inlet pipe has two connections to the waterjacket space, while the outlet which runs along the entire top of the cylinder block splits into two branches which connect with the radiator.

The timing gears are inclosed in the usual way at the forward end of the motor. The large camshaft gear is made of gray iron, while the crankshaft gear and the magneto shaft gear are made of steel. Thus steel runs against iron, which insures quiet running. The gears are spirally cut, which also has a tendency to reduce noise. Valve tappets and springs are all completely inclosed by a plate which has a holding thumbscrew at either end.

The 14-inch flywheel is uninclosed and through a ring gear attached to its outer rim the cranking motor gear drives the crankshaft for starting purposes. This motor, as well as the separate electric generator, form the principal units of the Rushmore electrical system with which these cars are all equipped in the new

series. The electrical system has nothing to do with the ignition system, which is a dual type presided over by a Michigan magneto and dry cells.

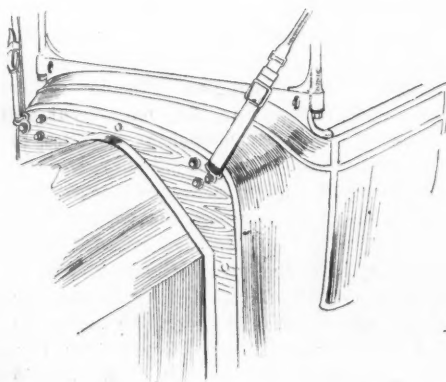
The generator is mounted on the left forward side of the engine and drives through a silent chain from a sprocket on the front end of the magneto shaft ahead of the timing gear case. It is geared 2 to 1 to the engine, while the cranking motor, mounted on the opposite side and at the rear, so as to be close to the flywheel, has a reduction of 8 to 1. There are no intermediate reduction gears between the electric motor and the flywheel, a small pinion on the end of the motor armature shaft meshing directly with the flywheel gear when in cranking position.

The Rushmore system as installed on these cars includes a 100-ampere hour Willard storage battery. The whole system operates on 6-volts, and, in addition to the principal units just mentioned, there are a two-point switch for starting the electric cranking motor, a switch block and junction box for the lighting system and a push button gang switch for controlling the lights. Inasmuch as there are no side lights, the switch takes care of the operation of the dimming attachment for the headlights for city work.

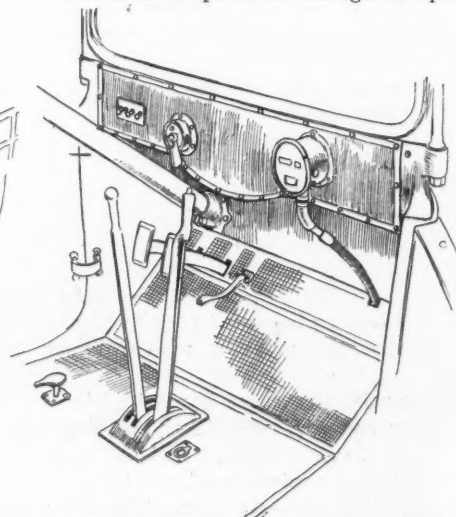
Electric Cranking System

The generator charges the storage battery and furnishes current for the lights, while the battery in turn gives out its current for operating the cranking motor and acts as an auxiliary to the generator for lighting when the latter is not running. The generator will deliver sufficient current to burn all of the lights at a car speed of 12 miles an hour on direct drive. At a higher speed a surplus of current is generated and this goes to the battery. The generator requires no attention aside from the refilling of the oil cups every 2 or 3 months.

The motor is powerful enough to spin



NEW REGAL DASH WITHOUT LAMPS



INSTRUMENT BOARD AND CONTROLS

the gasoline engine at from 90 to 125 revolutions per minute if the battery is fully charged. When the starting switch is closed by pressing down on the pedal for the purpose, a small current passes into the motor and starts the pinion revolving slowly and at the same time draws it into easy engagement with the flywheel gear. As the switch is pressed still further into contact, the full strength of the current comes direct from the battery to the motor, spinning the engine. At the first explosion the engine runs faster than the electric motor and the pinion is automatically thrown out of mesh with the flywheel gear. The switch block and junction box is located on the back of the dash and is a terminal for all the generator wires.

Motor of Overslung Car

The model C motor is somewhat higher in power than the model T, although in general appearance it is much the same as the other. It produces about 35 horsepower normally, and is also of the L-head block cast type with four cylinders. The crankcase is split into two halves, the upper half carrying the three-bearing crankshaft and the camshaft, which also has three bearings. The cylinder dimensions are 4 by 5 inches and the same general casting design as that of the smaller motor is used, differing only in the integral casting of the exhaust manifold with the cylinder block on the left side and the single inlet water connection at the front of the motor. The motor is supported from the main frame direct, in contrast with the subframe construction used in the underslung model.

In other respects it is similar to the model T power plant. The cranking and lighting system is also the same, except that the cranking motor reduction between it and the engine is 7.5-6 to 1 instead of 8 to 1.

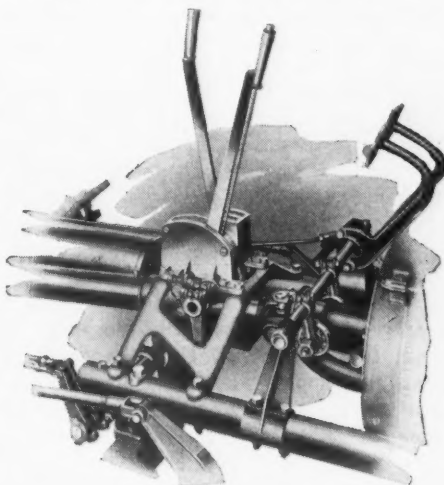
The Regal models have cone clutches of the same construction, although that of the model C is slightly larger than model T carries. The mean diameter of the former is 14 inches, while the latter has 13½ inches for this dimension. These clutches are leather faced in the usual way.

There is a slight change in the clutch mechanism of the model T, in that the clutch shifting yoke has been provided with a ball bearing and the clutch disengaging mechanism has been changed from a plain bronze bearing to the annular

ball type and consists of two bearings which are carried on the ends of two levers keyed to the pedal shaft.

In changing the control to the center, the underslung car has been provided with a bridge construction carried on the rear ends of the tubular motor subframe rails. This bridge is arched in the center and, due to this form, brings the gearshift quadrant and the emergency brake ratchet up high enough to come within the floor level. In the model C construction, the quadrant and levers are supported on a cross-frame member in the usual way.

The rear systems of both models are identical in design and consist of the gearset, inclosed propeller shaft and rear axle, all in unit. The forward end of the propeller shaft is provided with a



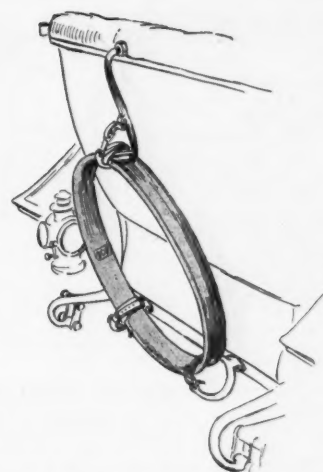
TUBULAR SUBFRAME AND CONTROL

universal joint, the torsion tube commencing just back of this and running back to the forward flange of the gearbox, to which it bolts rigidly. At the other end of the gearbox the axle housing attaches through a flange.

Gearset Is Very Compact

The gearset on these cars is of very compact design and provides the usual three speeds forward. It is a Covert design and both the mainshaft and the countershaft are carried on Hyatt spiral roller bearings. The rear axle is of the three-quarter floating type in which the load of the car is carried on the housing.

The model C springing on the new models has been changed in that both front and rear springs are hung below the axles, attaching to them in the usual way, however. This allows the frame to be lowered also



TIRE CARRIER ON UNDERSLUNG REGAL

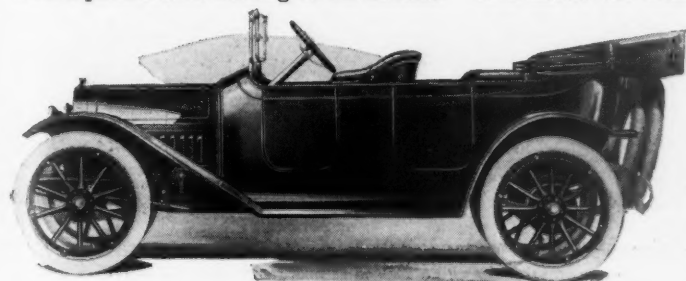
by several inches. Road clearance is unaffected by this change.

Bodies of these new Regals are brought up to the latest demands of the motoring public in that the flush side effect has been carried out. The cowl has been sloped into the bodies proper and now the dashes have been altered and improved to suit. The running boards are clear, while the doors fit snugly to the body outline, none of the hinges or handles being in view. Fenders are rounded at the rear to follow the line of the wheels, while a new type of tire carrier is fitted at the rear to further clear the running boards.

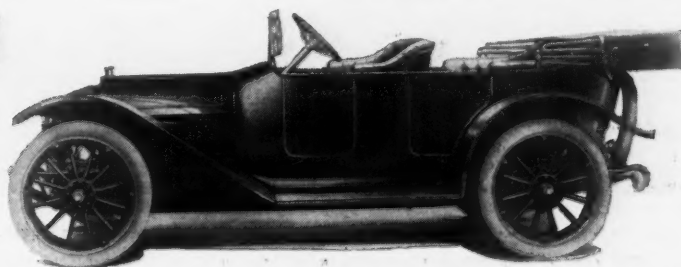
Underslung Suspension

This season, the Regal company is listing all of its models with full equipment, the custom in the past being to list the equipment extra. Besides the electrical apparatus, the fittings include mohair top, rain-vision ventilating windshield, speedometer, curtains, tire irons, demountable rims, electric horn attached to the motor and complete tool equipment. The prices last season were \$950 for the underslung touring car, \$900 for the roadster, and \$1,250 for the underslung coupe and overhung model C touring car. The equipment of all of these was extra. The new series Regals are listed, \$1,125 for underslung roadster and touring car, \$1,600 for the underslung coupe, and \$1,350 for the overhung model C. These latter prices include complete equipment ready for the road.

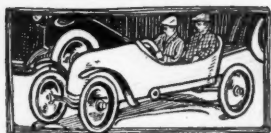
Springing of the underslung model is well known and consists essentially of running the frame below the axles, suspended from them by springs. The long rear half-elliptics also run under the axle.



REGAL MODEL C OVERHUNG TOURING CAR



UNDERSLUNG REGAL MODEL T



Cyclecar Development

Rocket Makes First Cyclecar Cross-Country Tour

ATENTION of skeptics who have scouted the idea of an American cyclecar on American roads being able to make real trips off the boulevards is called to a 1,000-mile trip of three states just completed.

Years ago Stephenson's Rocket set the pace for railroading and marked the beginning of a new and vast industry. It is, perhaps, significant that America's first cyclecar to do real cross-country work bears the same name, the Rocket, and that it hails from Detroit.

There have been those critics who have said that Detroit could not produce a real cyclecar as motor car practice would interfere and engineers be prejudiced toward the small-car type. The Rocket is a real cyclecar with chain and belt drive, 36-inch tread, tandem seating and 450-pound weight.

First Real Cyclecar Test

We, the interested and waiting-to-be-shown public have waited long for a real knowledge of what writers and designers have predicted and hence the details of a cross-country run through three states, accredited by onlookers along the whole route, is of exceptional interest.

The trip made last week extended through parts of Michigan, Ohio and Indiana and at Indianapolis, the News recorded the passage, as Indianapolis is the stopping point in the forthcoming cyclecar run from Chicago. A letter from John J. Batterman, one of those who made

the trip, throws light on the new kind of road experiences the cyclecar owner may look for.

From Detroit to Indianapolis

"It has been our experience," says Mr. Batterman, "that the public questions the veracity of cyclecarists. We completed a trip of 201.7 miles from Napoleon, O., to Indianapolis, Ind., in a single day from 7:15 a. m. to 7 p. m., giving us an average speed of 17 miles, not even deducting the noon halt for luncheon, which is creditable work for any size or priced car considering the roads we traversed. The following day while driving about Indianapolis numerous stops were made in the business section of the city to better enable the public to feast their eyes and curiosity on a real type of cyclecar. The ever persistent remark was to be heard: 'It is a smart little car, but they won't be able to go over country roads.'"

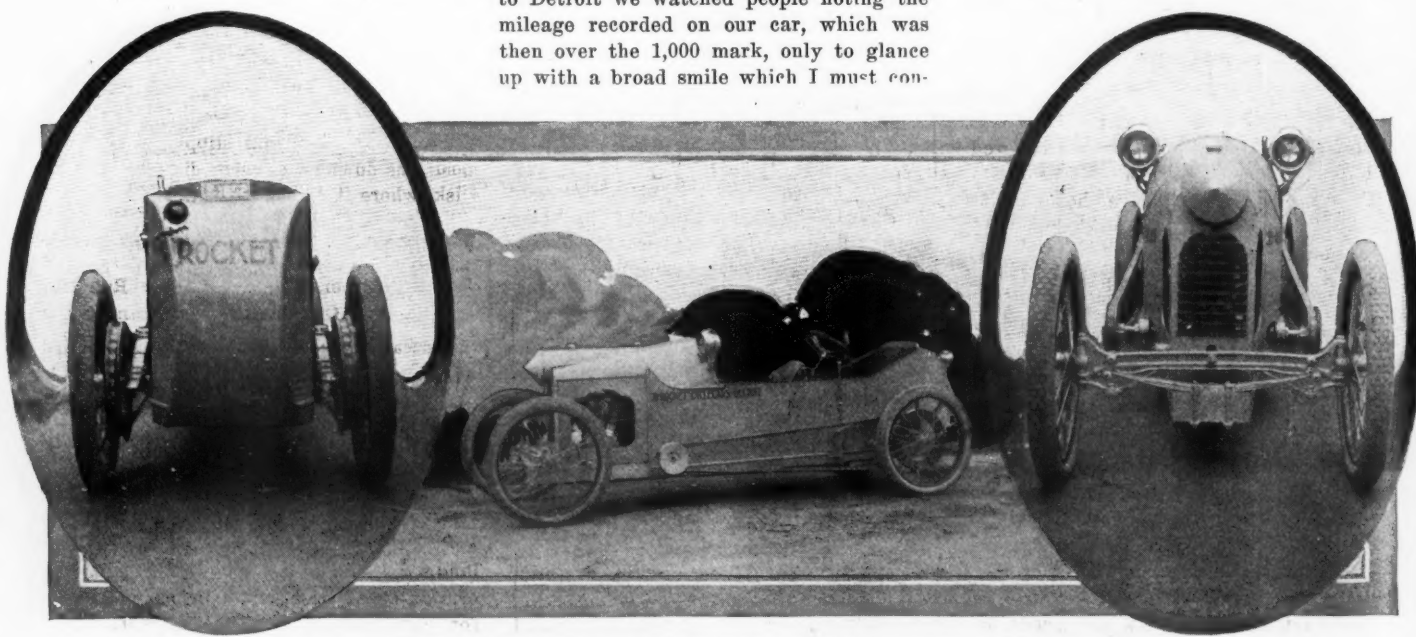
"It then would be with considerable pride that we would inform the crowd—always a complete and crowded circle surrounding the car—that we had just driven from Detroit. Instantly we were given a look that stamped us as charter members of the Ananias Club, so that our courage would fail us to add that the Detroit-Indianapolis run was made in 2 days in 21 hours running time, giving a total mileage of 356. Furthermore, Detroit was marked in large lettering on both sides of the car. Upon our return to Detroit we watched people noting the mileage recorded on our car, which was then over the 1,000 mark, only to glance up with a broad smile which I must con-

fess was at least a trifle disconcerting.

"We find our chief joy is when occupants of the large motor chariots look down upon us patronizingly, to give them a couple of notches of the throttle and then return the smile, but it takes a turn of our heads rearward to bestow it upon them. Of course, this is all done in the best of humor. The little car looks mischievous to the people and one feels tempted to play the part. I predict that good old fashioned romance will be reborn by the advent of the little power vehicle. It will be everybody's car and glory be! it holds two—the world's best company. It is great fun threading through traffic and not only gaining a half block in every block traveled on the our big brothers, but best of all, when halted at a crossing to get off together as the barrier raises and before our ponderous neighbors negotiate their gear shifts have a 100 foot lead and without the anxiety of the rear mudguards having found sufficient clearance.

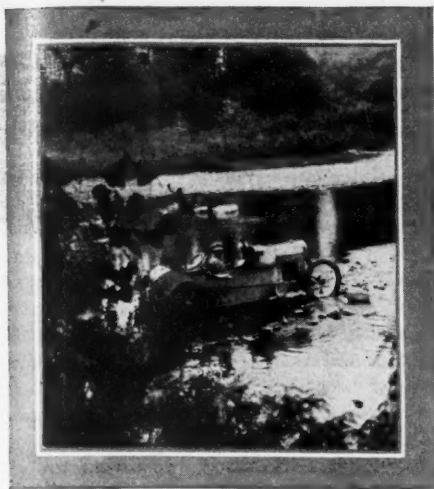
Trip Proved Thorough Test

"Our tests have been made in the severest possible way, through deep sand, mud and slippery roads, up and down steep grades and around hair-pin turns, and we now have the approval stamp on every department of our cars, reliability, practicability, road adaptability and trifling running cost, and we are pleased to give you the formal announcement of our specifications as requested:



VIEWS OF THE NEW ROCKET TANDEM CYCLECAR WITH DETAILS

The center illustration shows the neat hood and tank, the belt drive and rear seat steering. The reproduction at the left is a rear view, at the right a front view. The rear belt pulleys are of small diameter. An 8-inch road clearance is allowed. The frame is of wood and under-slung



THE ROCKET CYCLECAR FORDING A STREAM WHERE A BRIDGE WAS DOWN NEAR MARION, O

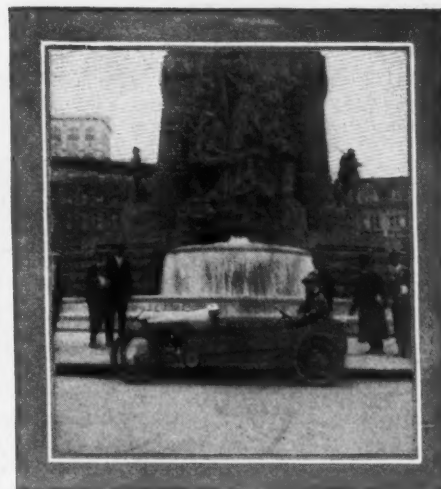
"Tread, 36 inches; wheelbase, 100 inches; cowl dash joining bonnet in a stream line with conical pointed tank forming the top of bonnet, the sides of the latter being partially open; tandem seating with front or rear drive; power plant is a De Luxe 9-12 horsepower motor, having large ball bearings throughout, mounted in steel-lined pockets. The motors are equipped with a new de-compressing system and the cranking is direct and rendered easy. The operating lever closes after the motor has been started." A

planetary transmission is mounted on the jackshaft with two speeds forward and a reverse. The stock ratio gives 3 to 40 miles. Racing pulleys may be quickly fitted giving 50 miles per hour. The drive from the motor to the jackshaft is by a short chain and from the jackshaft to the rear wheel pulleys by double V belts. We have not had the slightest fault develop with the belt drive, and I could write pages on the merit of the double V-belt drive. We consider it the ideal and silent drive for cyclecars.

Details of Rocket

"A large cooling fan is mounted on the motor with ball bearings to prevent overheating of the motor when stopping about town. The low speed and reverse each have a pedal and the high is operated by a lever which in its extreme rear position releases the high speed and engages the emergency brakes. The body is underslung with an 8-inch road clearance. The rear springs are semi-elliptic and the front transverse. All springs are underslung. The car rides with delightful comfort even over rough roads, and wet or slippery roads have no terrors for this differentialless cyclecar. As to turning corners there seems to be no limit to the speed possible, even at right-angle turns.

"In the test above mentioned the car carried two persons. Both Mr. Booth and myself drive one of our cars at least 80 miles per day in and around Detroit. We



STOPPED AT THE CIRCLE, INDIANAPOLIS, DURING 1,000-MILE TRIP. NOTE THE TORPEDO STERN

will be prepared at an early date to make deliveries.

ZIP COMPANY IN THE FIELD

R. W. Phelps, formerly advertising manager of the Moline Automobile Co., East Moline, Ill., has taken up the cyclecar, as president of the Zip Cyclecar Co., of Davenport, Iowa. This car has been on the road for several weeks and is said to have shown speed and fuel economy. Details of its construction are to be given out later.

Answers to Cyclecar Inquiries from Interested Readers

FRICTION DRIVE IS EFFICIENT

Compares Favorably with Chain or Belt Transmission

MACON, GA.—Editor Motor Age—I am planning to build a cyclecar and desire to know if it takes much more power with friction drive than with chain or belt.—C. J. W.

Friction drive is generally used in conjunction with chain or belt and can hardly be compared, for the friction drive turns at right angles, while chain or belt is direct. The friction should be compared to bevel gearing or worm.

The loss in chain drive, however, is about 7.5 per cent, including bearings, and in double gear reduction 10 per cent. Friction drive can be designed, and is used on cars today, giving a loss on high of about 8 per cent only, so that the efficiency compares very well with other types. On low gear the loss is greater, but this is also true of gear drive, which loses with bearings when low gear is in operation as high as 30 per cent.

Understanding of friction drive losses may be had from a study of the drawings representing a friction drive with disk of 12-inch diameters, the plate radius of 6 1/4 inches shown in Fig. 1.

The friction wheel, paper faced, is shown in high position. It will be understood that slipping is taking place all the time on the plate, the only spot really rolling being at the central line A of the

wheel. The outer edge B of the disk will be traveling faster on the wheel than the wheel and at C, the inner edge, slower. A wheel of 1-inch face is shown.

The line A presses on a 5/4-inch radius. This rolls on the plate, making a circle of 36.128 inches. The edge B, of the same

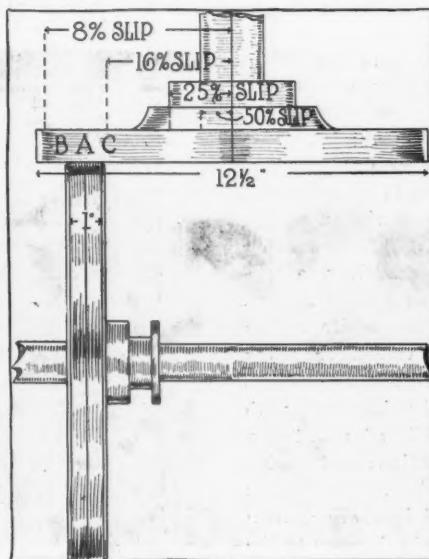


FIG. 1—SLIP IN FRICTION DRIVE

Loss is not so great as supposed but the construction is very cheap for the results obtained

diameter, rolls on a circle of 37.691 inches on the plate, a slippage of 1.571 inches, while C rolls on a circle of 34.558 inches, slipping also 1.571 inches. This slippage in each case is about 4 per cent of the circle diameter, or 8 per cent in all.

If the disks were larger the efficiency would be greater, or if the wheel width B-C were narrower. This must be wide enough for wear, however. The figures show the proportional slippages at other positions down to 2 inches diameter on the disk, where it is 25 per cent.

NO HORIZONTAL OPPOSED ENGINES

None in America That Answer Requirements—One Make in England

PADUCAH, KY.—Editor Motor Age—Where can I get a two-cylinder horizontal opposed motor suitable for cyclecar work?—E. J. Sears.

DELPHOS, O.—Editor Motor Age—Where could we obtain a horizontal opposed engine and what width frame would it require for said engine as shown in Fig. 6, in Motor Age for August 7, 1913?—Peltier Bros.

No cyclecar motor of this type is made in America to date. You might write Douglas Bros., Kingswood, Bristol, England, who make a very excellent motor of this type which might be a good basis for your work. The Veerac Motor Co., Anoka, Minn., makes a two-cycle motor of this type but too large for your work. The overall dimensions would have to be had from the makers.



TYPICAL ROAD HOUSE ON MILITARY TRAIL AT MILLER

Motor Truck Invades Alaskan Wilds

Army Officers Make Trip in White

UNITED STATES army engineers have just completed an expedition in a motor truck, driving half way across Alaska to a point within 2 degrees of the Arctic circle.

Fording scores of glacial streams, running through canyons and crevasses of solid ice from 800 to 1,000 feet in depth, crossing the Alaska and Chugach mountain ranges on steep and icy trails over unused passes, blasting their way through forests and giant boulders, the party drove from Valdez to Fairbanks and return, a distance of 826 miles in 19 days. Thrilling experiences with snow-slides, washouts and quicksand were reported by the party.

Although the trip was undertaken primarily to determine the possibility and practicability of motor transportation in Alaska, the engineers mapped out a route which reduces by at least 1 month the time required to reach the larger interior towns, particularly those on the upper Yukon and the headwaters of the Tanana river.

White Truck Selected

The expedition was typical of Uncle Sam's method of getting important information. A White 1,500-pound truck had been shipped to the Alaska road commissioners early in the summer. It was delivered in Valdez on July 26 and 2 days later it was started on the trail to Fairbanks, there to be joined by Lieutenant-Colonel Richardson, president of the board of road commissioners, and other engineers.

The truck left Valdez with a load of supplies and a quantity of mail for camps along the military telegraph line. Con-

siderable mail was carried to points where none had been received in over a year.

In order that the trip might reveal average conditions, the truck was not especially equipped, except in the matter of fuel and road tools. Food was carried for use only in desolate regions where there are no road houses or settlements.

Leaving Valdez in a drizzling rain, they crossed the delta of the Valdez glacier and almost immediately entered Keystone canyon, 14 miles long, whose walls of ice and rock rise nearly 1,000 feet above Lowe river, a typical glacier stream. The entire region is volcanic, showing great outcroppings of mineral, with rock of wierd formations and varied colors. Great ledges of iron ore gave a reddish tinge to the walls. The surface was covered with a thin blanket of volcanic ash. The trail

leads along narrow cliff-trails, blasted out of solid rock and running almost at the foot of a number of beautiful cascades.

After spending the night at a settlement known as Workman, they resumed the journey through the canyon and commenced the real ascent of the trail over the Chugach mountains. With a steady climb of 25½ miles to the summit at Thompson's pass, an elevation of 3,000 feet. While the temperature was decidedly lower at the summit, the danger of melting snow and ice was not entirely abated and the truck ran into snow slides at four different points. Fortunately none was of great proportion and the crew escaped with nothing worse than the extra work of digging themselves out. The descent from the summit was found to be much sharper than the ascent and the truck rapidly descended into another delta region and forded half a dozen glacier streams before they reached a camp at Beaver Dam.

Slow Progress Made

The next 3 days were spent on trails that have been opened in the last 3 years by the Alaska road commission in the deltas of the Copper and Gulkana rivers. Corduroy trails, built of scrub timber, extremely rough and narrow at best, prevented the party from making rapid headway. For many miles the trail passed through dense scrub and beds of Alaska



ROAD WORK ON MILITARY TELEGRAPH TRAIL RUNNING THROUGH DELTA COUNTRY



CORDUROY TRAIL THROUGH THE DELTA OF THE GULKANA RIVER

moss into which heavy objects would sink 3 feet or more, making hard work for the engineers.

Much time was lost on the banks of treacherous streams, fed by melting glaciers and churned by huge boulders whose exact location could be determined only by wading out into the stream before attempting to cross with the truck. The Copper river valley, though walled in by mountains and glaciers, was found to be rich in vegetation and the natives, chiefly Indians, were abundantly supplied with many vegetables. Floral growth equally surprised the members of the party. The whole side of one mountain was covered with a crimson growth which the Indians call fire flowers.

Difficulties Encountered

From Beaver Dam north, the engineers experienced the greatest difficulties of their trip. Following the Copper river valley to the fork of the Gulkana, they traversed a vast area of delta land where tractive conditions were worse than the region they had just left. The military trail, passing through a low and marshy country, was alternately covered with ice and glacier mud. In the worst places the wheels were wrapped with stout rope and the truck had no difficulty in pulling through, but it was operated on low gear during the entire afternoon. To pass

through several timber tracts it was necessary to cut down scores of trees and blast out stumps, rocks and ice.

On reaching Gulkana the party got their first glimpse of Mt. Wrangell and Mt. Blackburn, 17,000 and 16,000 feet, respectively, higher than the tallest peak of the Rockies. They were plainly in sight. Further away they saw the smoke of an active volcano, Mt. Sanford, whose elevation is 14,000 feet.

Three days of constant trail-blazing and pathfinding brought the truck to Paxson, on the Gulkana river at the foot of the Alaska range. Following the military trail straight north they began a gradual ascent into the ice-clad mountains of Alaska's principal range. The

trail carried them high on the sides of the mountains, giving magnificent views of a number of large lakes. According to the engineers, the grades averaged only 6 per cent but there were many places where it was necessary to climb a 16 per cent grade on a solid and rough sur-

face of ice which made tough going. To guard against skidding and the possibility of sliding off the innumerable cliffs, the crew made use of a coil of steel cable and wound the wheels the same as they had previously done with rope. This expedient proved highly successful in giving traction for the climb but did not eliminate skidding. While climbing cautiously through one of the passes, along the edge of a steep precipice, the bank gave way under the weight of the truck and the entire outfit had a narrow escape from sliding off into a violent glacier stream.

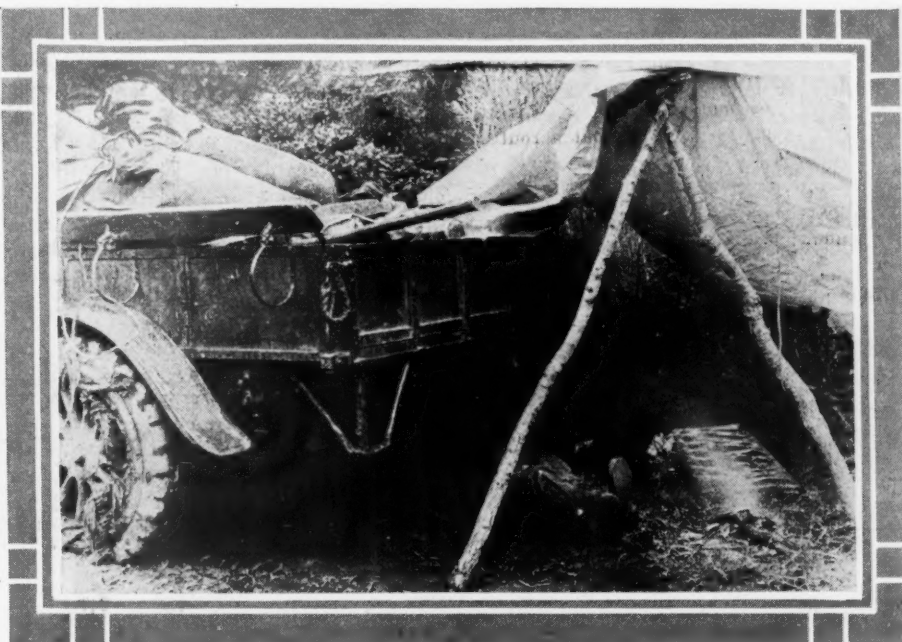
Steep Grades Climbed

Near the summit they passed a massive peak which had been worn into the shape of a perfect dome. The higher the altitude the steeper they found the grades. It was a common occurrence to be halted on the side of a mountain by small wash-outs due to melting glaciers.

At several points the grades were so steep and the turns so sharp that it was necessary to maneuver with the reverse gear to make the turns. No trouble was experienced in keeping the engine cool. In fact the cooling water did not boil at any time on the entire trip despite long pulls on low gear.

The descent from the summit presented no difficulties other than the necessity for frequent inspection of the trail for considerable distances before driving ahead. After a long spell of cautious and skillful driving, they dropped down into the valley of the Delta river and camped all night on the Guncreek flats which were composed almost entirely of glacier mud and quicksand.

Leaving the flats there was a marked change in the character of the country. Flats and marshes were succeeded by giant boulders, subjecting the truck to fearful tests of distortion. Rain added to



CAMPING ON THE GUNCREEK FLATS IN THE VALLEY OF THE DELTA RIVER

their discomfort. The military trail to the Tanana river passes a place known as Donnelly and here the crew found evidence of real road work. A clay and gravel surface with a fairly good foundation began at Donnelly and lasted for 90 miles over a rugged country with many stiff climbs and scarcely any snow or ice. While the surface was soft, it was easily negotiated by the truck.

Ferrying the Tanana

The truck was carried across the Tanana river on a ferry to the town of McCarty and then driven along the bank of the Tanana to Munson's. On the ninth day, after covering 379 miles from Valdez, it reached the northern end of the journey at the town of Fairbanks, which is situated on the Tanana. This is a branch of the Yukon and Fairbanks is the extreme point of navigation, 2 degrees from the Arctic circle.

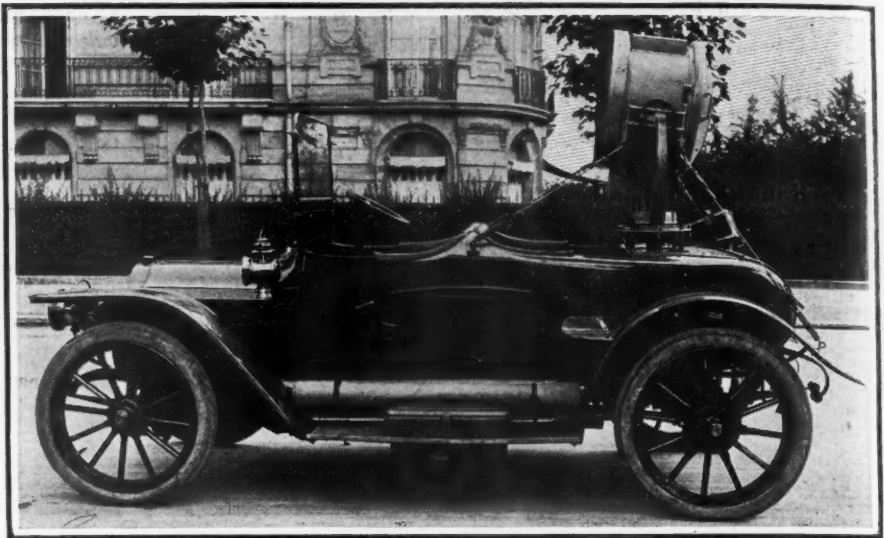
Three days were spent in Fairbanks preparatory to the return trip. The truck was again loaded with supplies and mail. Colonel Richardson took personal charge on the return trip and was accompanied by Superintendent Ingraham, Lieutenants Egerton and Steef, Thomas H. Parramore, Jr., and Homer Jones. The total load for the return trip was 2,100 pounds, 600 in excess of the capacity of the truck.

Leaving Fairbanks on August 9, again in a downpour of rain, they retraced their route as closely as surface and weather conditions would permit. When they reached the Gunecreek flats they found that the steady rain of 3 days had made the glacier mud very sloppy and wiped out the trail for considerable distances.

Another Expedition Met

Near Gulkana, they met a military pack of six horses, an army field wagon, a buckboard and a detachment of troops in command of a first lieutenant, sent out by the war department to investigate an alleged gold strike on the Chisana river. Six horses were required to pull a 2-ton load and most of the load necessarily consisted of feed for the horses.

Twenty-six miles south of Gulkana, at Willow creek, they made a detour to Chitina, adding 68 miles to their journey and lengthening the return trip to 10 days. At Sheep creek, just before re-entering the Keystone canyon, they were compelled to cut a swath in the woods for 500 yards to avoid a bad washout caused by the torrent of a melting gla-



MOTOR SEARCHLIGHT WHICH FRENCH ARMY IS TESTING

cier. A bridge 12 feet above the water when the truck crossed it on the outbound trip, had been completely carried away and it was necessary to cut through the woods to a suitable fording place.

When they reached the Keystone canyon the trail had been washed away in many places. Thousands of tons of rock and ice had been dislodged and, in falling, had carried away bulkheads of solid stone supporting the trail. This forced the crew to fill in great gulches with stones before they could proceed.

At the finish of the trip on August 19, the truck again was placed on the trail to carry supplies and mail to road camps and settlements in the vicinity of Valdez. Colonel Richardson said he believed that the road work contemplated by the Alaskan commissioners will make it possible to go from Valdez to Fairbanks in 4 days next summer.

HORNERS IN FIVE SIZES

The Horner motor truck, built by the Detroit-Wyandotte Motor Co., of Wyandotte, Mich., formerly was called the Grabowsky. Horner trucks are built in five sizes—1-ton, 1½-ton, 2-ton, 3-ton and 5-ton, and has such features as: Continental motor, Mea magneto, Brown-Lipe clutch, transmission and differential, Spicer universal joints, Whitney drive chains, Timken roller bearings and Ross steering gears. In the 1, 1½ and 2-ton sizes the motor is 4½ inches by 5¼

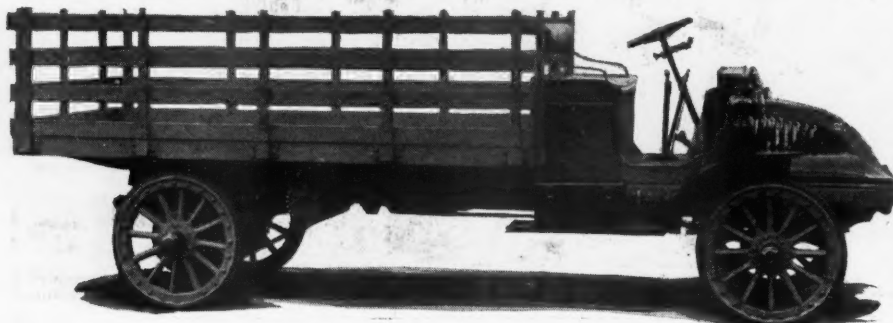
inches, inclosed valves, L head cast in block. In the 3-ton, the motor is 4½ inches by 5¼ inches, inclosed valves, L head, cast in pairs. In the 5-ton a large T head high-powered motor 5¼ inches by 5¼ inches is used. The lighter models have pressed steel frames and the heavier models structural steel. Frames, jackshafts, axles and forgings are made in the company's shops.

TESTING ARMY SEARCHLIGHTS

Side by side with the standard gasoline-electric generating plants drawn by a team of horses, the French army authorities are now carrying out tests in the annual maneuvers of a new type of motor car searchlight. This new vehicle is intended to supplement the powerful motor car searchlights employed for coast defense work and with the artillery regiments. It is a light vehicle carrying a 24-inch diameter searchlight, capable of averaging a speed of 24 to 25 miles an hour over give and take roads, and of being moved about from place to place with great rapidity. Unlike the large and more powerful searchlights, the new vehicle can only make use of its searchlight when standing still, but the light can be switched on almost instantaneously.

The chassis features of these motor car searchlights, built by the firm of Sautter-Harlé & Cie, of Paris, are practically standard. The motor is a four-cylinder 14 horsepower of 75 by 130 millimeters bore and stroke, driving through a four-speed gearbox, and by shaft to rear live axle. The dynamo is mounted under the driver's seat and is driven off the gearbox by means of a silent chain, the pinion being brought into engagement by means of a lever to the driver's left-hand. While being thoroughly protected under the driver's seat, the dynamo is fully accessible in this position, a big door being provided in the left-hand side panel.

It being intended that the men in charge of a vehicle of this nature shall remain in the field for long periods during



CHASSIS OF ONE OF THE NEW HORNER TRUCKS

which they will have to travel at high speeds, attention has been given to the question of comfort, and also to detail equipment with a view to quick operation and low head resistance. The passengers sit with their backs to the driver and his attendant, and have in front of them the electric searchlight mounted on a central spring pivot, and secured by four steel cables, each one carrying a coil spring and being clipped to hooks on the side of the body. By unclipping these cables the searchlight can be swung round or placed at any angle. In addition to operating from the rear platform of the motor car the searchlight can be lifted down, placed on a special tripod normally carried on the side of the car, and operated a distance of 65 yards from the machine. This allows it to be carried to positions on which it would not be safe to venture with the motor car. The insulated cable necessary for this distance work is contained within the rear locker of the car. The searchlight is declared to be capable of showing up objects plainly at a distance of 4 miles in clear weather.

A liberal clearance is provided on these motor car searchlights, the wheels being equipped with 950 by 105 pneumatic tires. If, as is expected, these vehicles give satisfaction in the practical tests now being carried out, they will transplant the horse-drawn plants at present in use.

CHANGES IN B. A. GRAMM'S LINE

The Gramm-Bernstein Co., manufacturer of B. A. Gramm's trucks, has announced its complete line for 1914. The 2 and 3½-ton trucks made in 1913 have been re-

tained with some changes. A 1-ton was added a few months ago and a 5-ton model is announced for delivery shortly. These trucks all follow very similar lines of construction.

In the 2 and 3½-ton but few changes have been made. The 4½ by 5½ four-cylinder Continental motor mounted upon its spring-supported sub-frame is retained while the transmission of the dog clutch type is also continued as before without change.

An important change has been made in the method of mounting the self-starter. In place of mounting it on the engine base and turning the motor through the fly-wheel, both starting motor and generator are now mounted on the gearbox cover. No sliding gears of any character are used in the mounting of this starter. All gears are permanently in mesh. The generator is driven by a silent chain. The starter is operated as formerly by the speed control lever, and the construction is such that it is impossible to engage the starter and one of the transmission dogs at the same time. No change has been made in prices.

A new member has recently been added to the B. A. Gramm's line in the nature of a 1-ton model. Due to the very much smaller carrying capacity of this machine, compared with the others, some changes in the design which has been followed on the other models, was, of course, imperative. In this model the motor has been placed in front of the seat and under a hood. A four-cylinder 3¾ by 5¼ Continental motor is used. It is carried by means of an improved three-point suspension. The clutch is a Hartford cone type while a three-speed forward type of gear-set is used. The axles both front and rear are drop forged and are large and unusually strong for the capacity of the

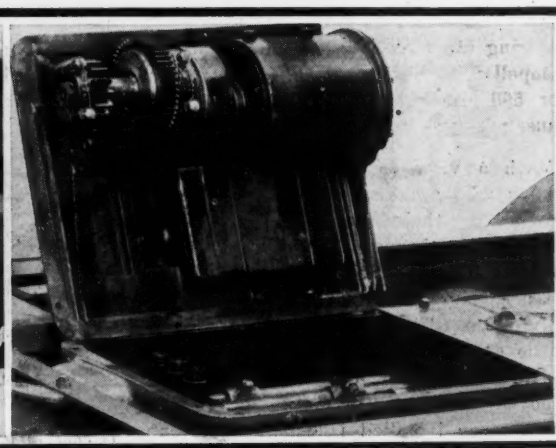
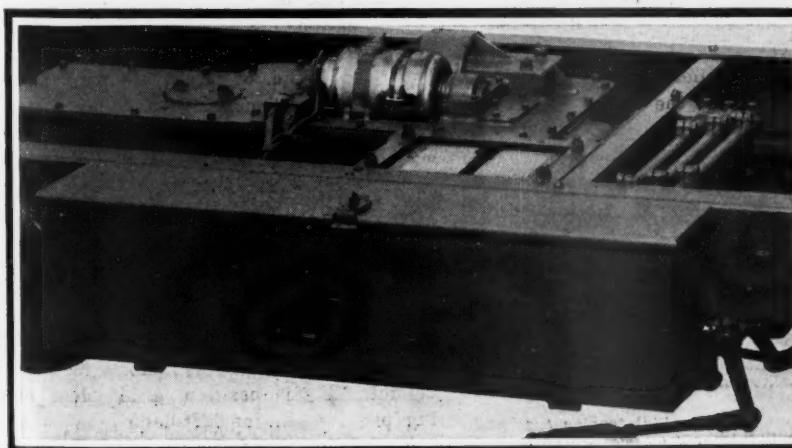
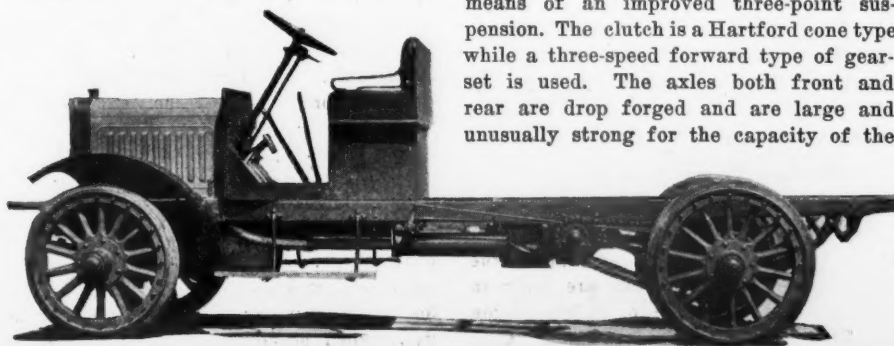
machine. The frame is of pressed steel. Final drive is by means of two roller type chains. Two sets of brakes are fitted, both acting on the rear wheels.

This model has been equipped with left hand drive and center control. The length of the frame back of the seat is 102 inches, allowing the use of 9 foot 6 inch body with ease. The wheelbase is 130 inches and 34 by 3½ tires are used in front and 36 by 4 in the rear, both of the solid type. The gasoline feed is by gravity from a tank carried under the seat. Any type of body will be built by the manufactures to order.

SAVING THE WHEAT CROP

The Tulare lake lands in southern California yielded one of the largest crops of wheat this year, and in consequence a great many thousands of sacks of grain had to be hauled from 12 to 25 miles from these famous grain fields. The transportation was a most difficult matter and every horse in the section was put into the harness and still the work was slow. One enterprising man, however, purchased a 5-ton motor truck and made a detour of the Tulare fields, which gave him 5 miles greater running distance than the road used by the teams, but a better road, as it was not cut and chopped up by the horses' hoofs and the wagon tires. By using two, and sometimes three trailers, he would bring as high as 12 and 13 tons of grain on a trip, rarely exceeding a speed of 4 or 5 miles an hour.

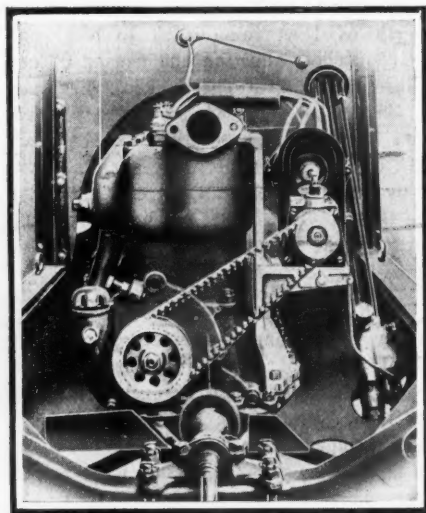
By arranging the trips cleverly, he was enabled to land his last load, which was always his biggest, about midnight, taking his load at a speed of 3 miles an hour. This grain would then be handed over to the warehouse the first thing upon opening, and he would start again, making two quick trips during the day with lighter loads, and one heavy trip at night. He has estimated to handle with his truck and trailers more grain than twelve four-horse teams could handle, and his gross earnings per day were well over \$100. During the 40 days' work he estimated that he had cleared between \$2,500 and \$3,000 net.



TOP OF GEARSET CASE OF A 3½-TON GRAMM CHASSIS, SHOWING METHOD OF MOUNTING STARTER AND GENERATOR. INSIDE OF GEARSET CASE COVER SHOWING GEAR ARRANGEMENT

Bosch and Splitdorf Announce Magnetos for Fords

Flywheel Instrument May be Used for Lighting



BOSCH-FORD INSTALLED IN A MOTOR

Note that the aluminum bracket upon which the magneto rests is fastened to the cylinder casting. The four wires leading from the magneto give it an air of simplicity

THE feature of the week in accessories is the simultaneous announcement by the Bosch Magneto Co. and the Splitdorf Magneto Co. of the introduction of a special type of magneto for Ford cars. In the case of the Splitdorf concern the magneto is entirely different from any previous type.

The Bosch uses the regular DU4 magneto. The chief difference between the two installations is that one, the Bosch, is driven by silent chain and the Splitdorf is direct gear driven. By the use of a high-tension magneto on Ford cars the four-unit coils are dispensed with and the flywheel magneto supplied with the car may be used for a lighting generator.

Installing these high-tension magnetos in Ford cars is not the work of an expert, both concerns issuing full instructions and giving all the necessary fittings. These instruments are said to give an efficient spark at exceedingly low engine speeds and may be used safely without a battery system for one quick turn of the crankhandle is sufficient to give the motor an initial start.

Bosch Magneto for Fords

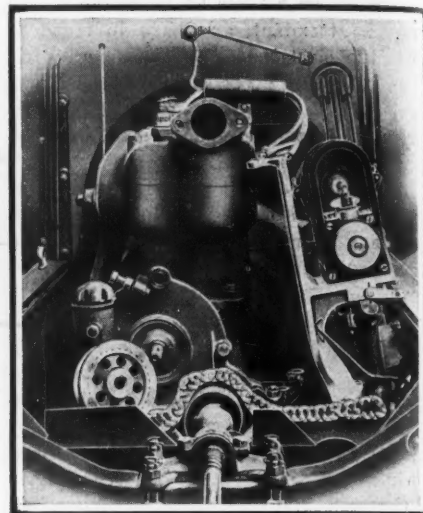
With a view to assisting those Ford owners who are desirous of using Bosch ignition on their cars, the Bosch Magneto Co. has brought out a special outfit consisting of a DU4 magneto and the necessary attachments for its proper installation. The feature of the system is the simplicity and ease of attachment and also that no important parts need be removed nor any drilling done. The Bosch when installed is driven by silent chain from the commutator shaft and the magneto itself is mounted on a

bracket so that the top of the magneto is on a level with the top of the cylinder casting.

The special attachments for installing the Bosch magneto in a Ford consist of an aluminum bracket, a driving gear on the commutator shaft and another on the magneto and various nuts and bolts for holding the different parts in place. The fan and pulley assembly of the Ford are removed, also the actuating rods from steering post to commutator, cover of the latter with the contacts, etc. As shown in one of the illustrations on this page the aluminum bracket extends down the side of the cylinder casting, this bracket being bolted to the engine base. The installation complete is shown in another illustration and brings out the silent chain drive from commutator shaft to magneto and also shows the accessible position of the magneto.

Many claims are made for this over the four unit coil method of ignition, which has been discarded by a number of Ford owners and either a master vibrator or a high-tension magneto installed. The Bosch magneto when used for Ford ignition is said to make the motor more efficient and eliminate all the inconveniences which may develop in coil ignition. No coil is necessary in the new Bosch installation and the work of placing the instrument in position may be done in a few hours with the tools found in the ordinary kit. The price of the Bosch-Ford system complete is \$70.

The Bosch installation requires the re-



BOSCH-FORD READY FOR INSTALLATION

Everything is about to be placed in position. One pulley is placed on the commutator shaft and the other is on the magneto. No drilling need be done

moval of but few unimportant parts. The magneto could be supplied with either fixed or variable spark control.

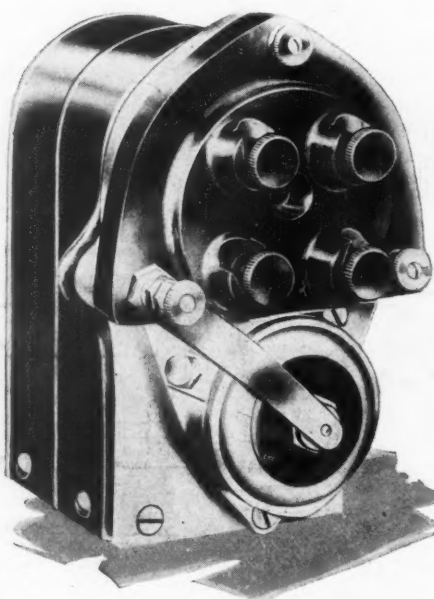
Splitdorf-Ford Magneto

Concurrent with the announcement of the Bosch Magneto Co. of the introduction of a special installation for Ford cars, comes one from the Splitdorf Electric Co. to the effect that that concern has produced and is marketing a Ford special high-tension, waterproof magneto, with a fixed spark. This magneto is gear driven and the gears are inclosed.

This, as with the Bosch system, does away with the coils on the dash, and the entire outfit, including magneto, base, gears and housing, switch terminals and bolts, may be installed by any owner in a short time without the necessity of doing any machine work. Full instructions are issued with each outfit.

The magneto itself is said to be waterproof and dustproof, and special care has been taken to make the instrument simple in construction. The base, to which the pole pieces are secured, is of aluminum and the armature revolving between these pole pieces operates on two annular ball bearings. The magneto circuit breaker is on one end of the armature shaft and revolves with it. The action of the magneto is similar to that of most high-tension instruments in that the secondary winding is on the armature and the separating of the interrupter breaks the primary circuit. The Splitdorf company suggests that the Ford flywheel magneto may be used as a generator for lighting current.

With the Splitdorf-Ford magneto one quick turn of the crank is sufficient to give a good spark at the plug terminals.



SPLITDORF-FORD MAGNETO

This magneto is of the high-tension type and is said to be both water and dust-proof. The armature revolves on two ball bearings. The fixed spark control is a feature of this installation

Latest Motsinger Carbureter Has a Single Air Intake

Only Adjustment on Steering Post

FEEDING gasoline and air in the proper proportions and regardless of engine speed is the feature of the Motsinger carbureter, recently introduced by the Motsinger Device Mfg. Co., Lafayette, Ind. This instrument employs but a single air inlet tube, the air being made to take two passages, one directly to the mixing chamber and the other around the needle valve, the latter air being called primary and the former secondary or auxiliary.

This carbureter, which is claimed to handle low-grade gasoline, is illustrated in Figs. 1, 2 and 3. Referring to Fig. 1 D is the auxiliary air valve and here lies a great factor in the new Motsinger. This valve is so designed that its effective area of opening is directly proportional to the lift. The needle valve N, is connected with the auxiliary air valve and the opening of the needle valve is proportional to the lift of the auxiliary air valve. This valve may be controlled by hand, this being the only adjustment necessary. The means is a lever on the steering column.

In Fig. 1 at A the air enters through the port below the auxiliary air valve and this air passes through the passage C2 or C as the position of the valve indicates. That air which passes through C goes directly to the mixing chamber and that going through C2 travels around the needle valve as the illustration shows. Any movement of the auxiliary air valve upward will cause the lever L to be moved upward. But this lever actuates a knife edge E, which in turn operates the needle valve N by means of the fork F. So it is seen that as the air is increased the fuel also is increased and the design of the carbureter is such as to make the fuel and air increase correct as regards each other. The proportion of air



FIG. 2—VIEW OF THE LATEST MOTSINGER CARBURETER SHOWING THE HAND CONTROL ON THE STEERING POST

and gasoline delivered may be controlled by the driver of the car by means of a hand lever which operates the cable K shown at B in Fig. 1. The cable actuates the knife edge E, which partially controls the lever L, and hence the air and gas supply. The cross-sectional diagram is shown in Fig. 3 and the carbureter, with air control, in Fig. 2.

The Motorists' Bookman

Mixed Metals

Arthur H. Hiorns, in his "Mixed Metals," has written a complete, interesting and valuable book on metallic alloys, taking up such matters as will be of interest to both the student and the advanced engineer. The introduction deals with the nature of metals and non-metals, also the properties of the noble metals, gold, silver and platinum, and gives a little space to the ancients' dealing with the metals of their times. A number of comparatively recent alloys are taken up, their method of production, the materials necessary and the characteristics of the resultant product. The book is indeed complete, the scope being very wide, comprising nearly every alloy of value commercially. The foundryman foreman and other interested in foundry work will find information concerning the metals with which they work, the types of cores used and the

methods of moulding and casting. A chapter is devoted to cleaning, dipping and pickling. The book, from the press of McMillan & Co., New York, is well worth the price asked—\$1.50.

Motor Bodies and Chassis

"Motor Bodies and Chassis," by H. J. Butler, and from the press of D. Van Nostrand Co., New York, is one which has been long wanting. The author has intended in his work to give an introduction into the study of the complete car, dealing as much with body design and construction as with chassis details. Although the book could be better illustrated, the author makes up for such deficiency in the text. One-half of the book is devoted to body design, construction, decoration and paintings, while the other half includes the motor, gearset and other mechanical parts of the chassis. The book is listed by the publisher at \$2.50.

The Gas Engine Hand Book

One of the latest books on the subject of gas engines is from the press of the Gas Engine Publishing Co., Cincinnati, O., and called "The Gas Engine Hand Book." The author, E. W. Roberts, M. E., wisely has spent much time on engine ignition, in which modern owners fail largely, and has devoted some time to engine starters. All the questions the average man interested in gas engines asks are answered somewhere in the 314-page book. For the beginner the hand book would hardly do, for the illustrations are mostly cross-sections. It is a good reference book for the student, however, and contains useful information for the engineer. It is listed at \$2.

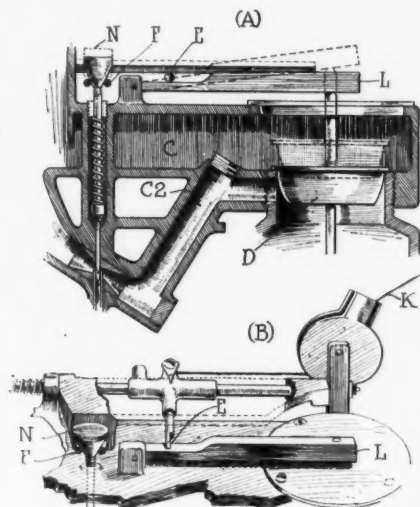


FIG. 1—SHOWING DETAIL VIEWS OF THE NEW MOTSINGER

The upper illustration shows the connection between the air valve and the needle valve through the lever L and the knife edge E. All the air enters through the port below valve D

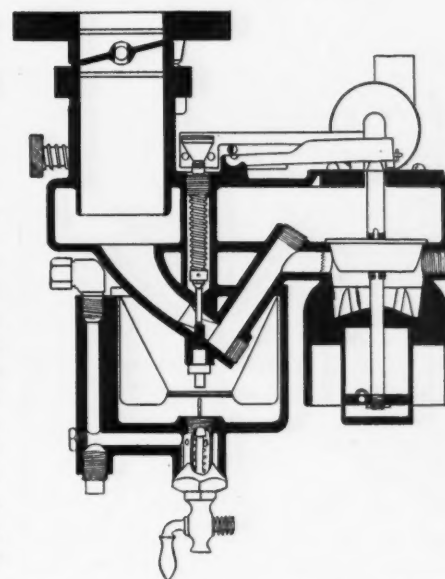


FIG. 3—CROSS-SECTION DIAGRAM OF THE MOTSINGER CARBURETER

This shows the two air paths leading to the mixing chamber and the position of the needle valve with reference to the fixed air intake. It also brings out the path of the fixed air

With Accessory Makers

Changes Pressure to Gravity Feed

FOR the unfortunate motorists troubled with pressure feed difficulties, the Webb Jay Motor Devices Co., Chicago, has brought out a system which changes pressure to gravity gasoline feed at a cost of \$10. This system does away with hand and power pumps and leaves the gasoline tank in the rear. It is simply an addition to the car and in its action is entirely automatic. The device appears in the form of a brass can about 10 inches high and 5 inches in diameter, fitted with three copper pipe connections. Fig. 1 illustrates the Webb Jay gravity feed, as it is called. The container is shown with three leads, one coming from the gasoline tank, or the line, another running to the intake manifold and a third to the carbureter.

In order to bring the gasoline from the rear tank to the device, engine suction is used. The operation of the system is as follows. When the engine is operating the suction of the pistons creates a partial vacuum in the container, because the piston suction acts through the pipe leading from the intake manifold. With the partial vacuum the gasoline will flow from the tank into the container through the pipe marked "to gas tank." In order to prevent the piston suction affecting the carbureter there is inserted in the container a flap valve. It is evident that as soon as suction takes place this valve will close, forming two compartments in the can. To return to the point where the gasoline flows from the tank to the container. This will continue until the engine suction is shut off. The float and

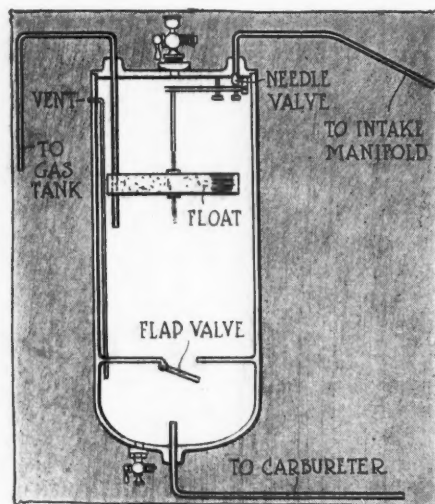


FIG. 1—CHANGES PRESSURE TO GRAVITY FEED

Engine suction draws fuel into the container and this fuel is fed to the carbureter in the usual manner. The float and needle valve control the engine suction

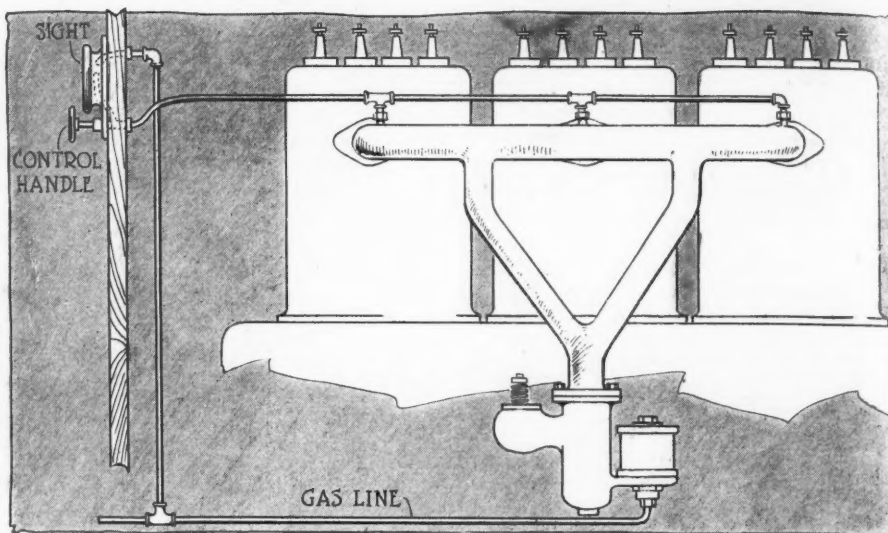


FIG. 2—NEW WEBB JAY PRIMER INSTALLED IN A SIX-CYLINDER HAYNES

The design of the intake manifold determines the number of holes to be drilled. A turn of the handle on the dash permits fuel to flow to the manifold. It will be noted the gas line is tapped and a union inserted. All the fuel which passes to the manifold in priming must pass through the sight feed

its mechanism shown is the same in principle as the float of the carbureter. As the level of gasoline rises in the container the float rises and when the container is full the needle valve will shut off the pipe from the intake manifold,

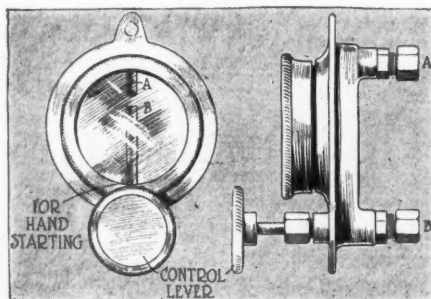


FIG. 3—DETAIL OF WEBB JAY SIGHT-FEED PRIMER

In starting the motor the handle is turned which permits fuel to run through the small hole and into the intake manifold. A rich mixture may be fed until the motor is warmed

thus stopping the suction. The flap valve will now open due to the weight of gasoline above it and this gasoline will drop to the lower chamber and thence to the carbureter. It will be noted the carbureter pipe extends upward into the lower chamber and that there is a pet cock to the left of the pipe. Any water or dirt in the fuel will drop to the bottom of the chamber and may be drained periodically.

Besides the device described above the Webb Jay Motor Devices Co., has made an improvement on the Webb Jay primer brought out some time ago. The new primer, illustrated in Fig. 2, installed,

and in Fig. 3 in detail, incorporates a sight feed. That is, the driver is able to see just how much gasoline, if any, is being sent to the cylinders to gain an initial start. Referring to Fig. 3, it will be noted there are two pipes A and B within the sight, the upper one connecting with a pipe which taps the gas line, as shown in Fig. 2 and the lower one which runs to the intake manifold of the motor. In starting the car, especially in cold weather, the handle is turned slightly to the right which permits gasoline to flow from the main line into the sight and at the same time a quantity trickles through the small hole in the standpipe B to the intake manifold. When the

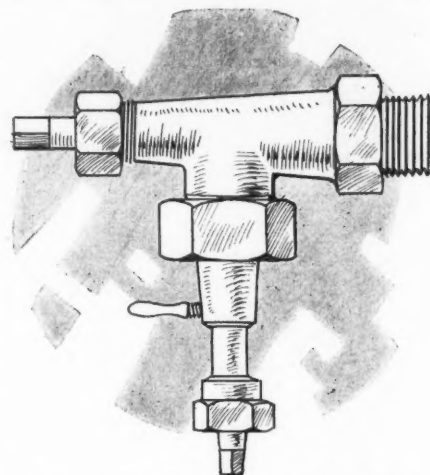


FIG. 4—OIE ACETYLENE REGULATOR VALVE

By the installation of this device at the acetylene tank union pressure is reduced to 2 ounces and the chances of leakage lessened. The flicker due to poor regulation is eliminated

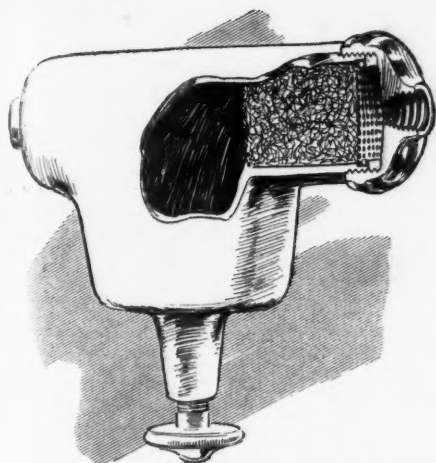


FIG. 5—ELLIS GASOLINE PURIFIER

The fuel enters the port at the left and is made to pass through quartz and felt screens, which is said to remove all solid matter and water

motor has started more fuel may be fed to the motor through the intake manifold and thus the motor made hot by the rich mixture, in a short time. Even when on the road, should there be necessity for feeding the motor more gasoline, the Webb Jay affords a convenient means of controlling the fuel, which will flow through the standpipe B when the handle is turned to the right. When stopping the car a turn of the handle shoots a rich mixture into the cylinders and eliminates engine racing, which is practised usually. The maker is offering the new primer at \$6.

New Sparks-Withington Pump

The Sparks-Withington Co., Jackson, Mich., have brought out a new pressed steel centrifugal water pump which is claimed to be stronger, lighter, better appearing and cheaper than pumps which are cast. Another feature is that all parts which come in contact with water are sherardized, which is claimed to make the metal proof against rust and the action of alkali water. It is claimed also that the metal is unaffected by the action of salts in the water which render the metal porous in some instances.

New R. I. V. Bearing

What is called a combination radi-thrust ball bearing is the latest product of the R. I. V. Co., of Italy, with a branch office in New York. The feature of this new bearing shown in Fig. 8, is its ability to withstand both thrust and radial load, the fact being accomplished by using two rows of balls so arranged that each row will do the work for which it is designed without interfering with the other. The bearing occupies slightly greater width than the regular radial bearing. This type of bearing has been in use abroad and met with such success that its introduction into this country has been advised.

Ellis Gasoline Purifier

Due to the poor grade of gasoline available for motor cars, it has become advisable to clean all the fuel which enters

the carburetor. A device which is doing this work satisfactorily is the Ellis gasoline purifier, which is claimed not only to filter the fuel but to purify it as well. The Ellis device shown in Fig. 5 is inserted in the fuel line anywhere between the gasoline tank and the carburetor. The fuel enters the chamber or pocket at the left in the illustration and then passes through two fine screens, a quartz and felt screen, which are said to remove all solid matter. Should there be any water in the fuel, the fact that it is heavier than gasoline will find the water in the large chamber shown. Draining is to be done periodically by means of the thumb-screw at the bottom of the device. The Ellis purifier is made of aluminum composition metal, with brass unions, and weighs about six ounces. It is being sold by the maker, the National Sales Co., Boston Mass., at \$3.50 and may be in-

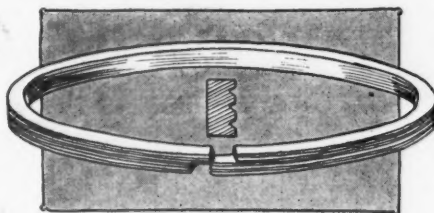


FIG. 6—OIL PACKING PISTON RING

When fitted onto pistons these rings are said to make gas leakage past the pistons impossible, thus giving an increase in compression. The three grooves harbor dirt and grit

stalled in a few minutes by inexperienced hands.

Oie Acetylene Regulator Valve

By reducing the pressure on the union of acetylene tanks from 250 pounds to 2 ounces, it is claimed the Oie regulator valve eliminates the chances of gas tank leakage. The device, illustrated in Fig. 4, is attached to the tank at the union

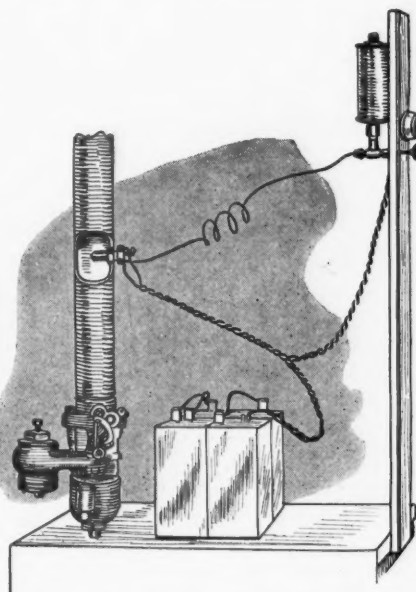


FIG. 7—VOLCANO ELECTRIC PRIMER

By pushing a button on the dash of the car a quantity of gasoline is vaporized by the heat of an electric current and the resultant vapor sent to the cylinders

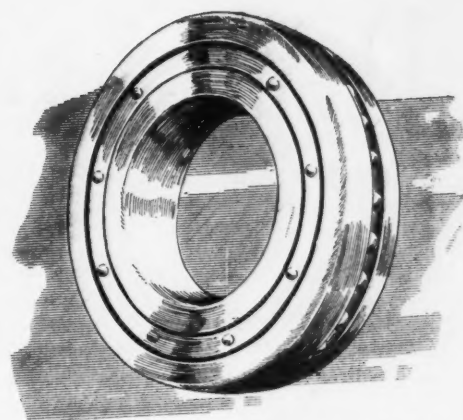


FIG. 8—NEW R. I. V. RADI-THRUST BEARING

The feature of this new bearing is its ability to withstand both radial and thrust load, which is accomplished by using two rows of balls placed at right angles to each other

and is claimed to insure a steady light, eliminating the flicker due to poor regulation occasioned by the unsteady pressure of the gas.

Volcano Electric Primer

Latest among primers is an electric design, selling for \$10 and operated by pushing a button on the dash. The primer is the product of the Volcano Electric Primer Works, Virginia, Ill., and is illustrated in position in a carburetor in Fig. 7. By pressing the button on the dash there is sent into the mixing chamber of the carburetor, it is claimed, a volume of vaporized gasoline sufficient to give the motor an initial start. The retainer behind the dash contains sufficient gasoline for 150 priming operations. The gasoline from this container flows through a pipe to the cup-like instrument, which is screwed into the carburetor mixing chamber. This cup holds about a thimbleful of fuel. Over this cup is a plate to which the fuel is fed by a wick. Should the cup be filled with fuel and the batteries turned on, by the pressure of the button on the dash, the heat generated by the battery current passing through the plate causes the gasoline to vaporize immediately. The pressing of the button not only sends current to the heating device but also permits gasoline to pass to the cup from which it is taken for vaporization.

Oil Packing Piston Ring

The Automobile Accessories Mfg. Co., Baltimore, Md., has brought out a type of piston ring which is claimed to prevent the leakage of gas past the piston, thus increasing compression. The ring is illustrated in Fig. 6 and, as will be noted, is itself made up of rings. The detail shows a side view, the three V-shaped grooves being formed by the rings. The grooves are said to be a harbor for grit and dirt, in which case they save wear on the cylinder wall. It is claimed also that the life of these rings is greater than that of the ordinary type.

Routes and Touring Information

Answers to Inquiries for Routes

Chicago-Jacksonville, Ill.

BIG STONE CITY, S. D.—Editor Motor Age—Has Motor Age any route maps or guides that will clearly direct me on a trip from here to Jacksonville, Fla?

I am familiar with the route as far south as Chicago, but do not know whether or not it would be practicable to drive through to Jacksonville. I am going south and will leave here about the first of October. Can Motor Age give me any light on this subject or refer me to anyone who can?—M. A. B.

As you are acquainted with the route from Big Stone City to Chicago we are not outlining that portion of your trip. From Chicago to South Bend the route lies through Whiting, Highlands, Schererville, Valparaiso and La Porte. From South Bend you have a choice of routes which are outlined in reply to an inquiry from St. Joseph, Mich., published in last week's issue of Motor Age.

Volume 4 of the Blue Book covers the section from Minneapolis to Pittsburgh, and volume 3 gives routings and running directions for the southeast, while volume 5 is devoted to the country west of the Mississippi river. The price of these books is \$2.50 each and they may be obtained from the Automobile Blue Book Publishing Co., 910 Michigan avenue, Chicago, if you cannot secure them locally.

Dubuque-Onawa, Ill.

Apple, Ill.—Editor Motor Age—Please give advice as to the best route from Dubuque to Onawa, Ia. I know the route to Dubuque.—J. D. Judd.

You will have good natural dirt roads all the way, practically all of them dragged regularly in accordance with the Iowa state law. Dubuque to Waterloo 91 m., via Dyersville, Manchester and Independence; Waterloo to Marshalltown 58 m., via Hudson, Rhinebeck, Grundy Center and Conrad; Marshalltown to Denison 142 m., via Ames, Boone, Jefferson, Carroll and West Side; Denison to Onawa 38 m., first going slightly northwest to Charter Oak then to Onawa. You will find the last part of your route over quite hilly country.

Spencer, Ia.-York, Pa.

Edgeley, N. D.—Editor Motor Age—Please give me a route from Spencer, Ia., to Springfield, Ill. I would prefer the road via Mt. Pleasant, Ia., if road conditions are good; from Springfield, Ill., to Decatur, Ill.; thence to Indianapolis, Ind.; thence to Pittsburgh, Pa.; thence to York, Pa. Please give distance and whether road conditions are considered generally good during the month of October.—G. F. Weaver.

From Spencer to Fort Dodge, 91 m., will be via Sioux Rapids, Marathon, Havelock, Gilmore; Fort Dodge to Des Moines, 93 m., via Dayton, Ogden, Boone, Madrid; Des Moines to Ottumwa, 92 m., via Prairie City, Monroe, Oskaloosa; Ottumwa to Mt. Pleasant, 48 m., via Fairfield and Rome.

The next section of your journey will be from Mt. Pleasant to Burlington, 30 m., via New London and Middletown; Burlington to Galesburg, 50 m., via Oquawka and Monmouth; Galesburg to Peoria, 54 m., via Maquon and Farmington; Peoria to Springfield, 70 m., via Delavan and Middletown.

Decatur is only 50 m. from Springfield and reached through New Buffalo and Niantic.

Indianapolis, the next objective point, 173 m. distant, will cause you to journey through La Place, Arcola, Oakland, Paris, Terre Haute, Brazil, Mount Meridian and Plainfield.

The National road, which you will have entered upon at Terre Haute, will be followed most of the way to Pittsburgh, as follows: Indianapolis to Columbus, 175 m., via Greenfield, Cambridge City, Richmond—where you will leave the National road and go through Eton and Dayton to Springfield; Columbus to Wheeling, 128 m., via Hebron, Zanesville, Cambridge and Morristown; Wheeling to Pittsburgh, 70 m., via Washington, Canonsburg, Carnegie.

To reach York you will now proceed from Pittsburgh to Bedford, 97 m., via McKeesport, Greensburg and Ligonier; Bedford to Gettysburg, 80 m., via McConnellsburg, Chambersburg, McKnightstown; Gettysburg to York, 29 m., via Abbottstown.

A few toll roads are still existent in the

east and you will reach one 1¼ m. from Chambersburg where you should purchase a ticket with coupons for 75 cents, presenting the coupons at the toll-gates as you reach them.

Unless there should be unusual rainfall the roads in the sections you will pass through should be in fairly good condition during October. At the crossing of the Mississippi river and again when close to the Ohio river and in the mountains of Pennsylvania you are liable to find the most trouble with slippery roads. But these roads are all in general use. Blue Books 5, 4 and 3 in the order named cover this trip with running directions.

Exeter, Neb.-Amarillo, Tex.

Exeter, Neb.—Editor Motor Age—Kindly inform me as to the best route from this point to Amarillo, Texas. Will much sand be encountered upon this route?—William P. Wallace.

At Fairmont, 7¼ m. from Exeter, turn onto the Meridian highway, which you will follow to Salina, Kan., passing through Bruning, Belvidere, Hebron, Chester, Belleville, Concordia, Minneapolis, Salina. At this point turn west to Wilson, then south to Ellinwood where you will come upon the Santa Fe trail. This will take you to Dodge City via Halsted, Burdett, Hutchinson, Nickerson, Sterling, Lyons, Chase, Ellinwood, Great Bend, Kindley, Taft, Offerle, Spearville and Wright.

Leaving Dodge City you will run through Reiner, Fowler, Plains, Springfield, Edmund, Liberal, Tyrone, Hooker, Guymon, Goodwell, Texhoma, Stratford, Ruby and Dumas, to Amarillo.

The Canadian river will be crossed by bridge about 20 miles north of Amarillo. There is a little sand on this route but nothing serious. For fuller directions than can be given here you are referred to Blue Book 5, which is devoted to the section of the country west of the Mississippi river. It is published by the Automobile Blue Book Publishing Co., 910 Michigan Ave., Chicago.

Quincy, Ill.-Biloxi, Miss.

Quincy, Ill.—Editor Motor Age—Local garage people here have advised me to write to Motor Age for information relative to a proposed trip. I wish to leave Quincy about December 1 in my five-passenger, four-cylinder Mitchell, 1913 model, and tour to Biloxi, Miss.

If it is a very hard trip I will not undertake it, as I will be accompanied by my wife and two children.

I have a fine chauffeur who has always been able to take care of every trouble such as we have met with while on the road, and I would take him with me.

I would like to know in a general way what

character of roads I would travel, what route Motor Age would suggest as the best, and about how long it would take to make the trip.—Thomas E. Thompson.

There are but few improved roads in the country through which you anticipate touring. The soil is much of it clay, which in wet weather makes travel difficult. You will also find some rough places, although none of which would be called impassable. Should the fall weather be dry you will have a much pleasanter trip than if there is considerable rain between this and the date of your leaving.

As to the time it will take, that of course, depends very largely upon the rate at which you wish to travel. As distances are given you can reckon what you wish to make your daily mileage.

To make the trip you should go south through Hannibal, Louisiana, Wentzville, St. Charles to St. Louis, the distance 152 m.; St. Louis to Paducah, 193 m., via Freeburg, Coulterville, Pinckneyville, Murphysboro, Anna, Metropolis; Paducah to Nashville, 168 m., via Egner's Ferry, Cadiz, Hopkinsville, Adams, Springfield; Nashville to Birmingham, 219 m., via Columbia, Pulaski, Athens, Decatur, Hartsells, Cullman, Blount Springs, Warrior; Birmingham to Montgomery, 112 m., via Montevallo, Clanton, Wetumka; Montgomery to Mobile, 182 m., via Selma, Orrville, Gastonburg, Thomasville, Grove Hill, Tombigbee river ferry, Oak Grove, Mt. Vernon; Mobile to Biloxi via Orange Grove.

Volume 3 of the Blue Book will give you running directions.

Marion, Ia.-Connersville, Ind.

Marion, Ia.—Editor Motor Age—Kindly advise the best route from Marion, Ia., to Connersville, Ind., also an estimate of the distance.—Subscriber.

Marion being situated on the Transcontinental route you should follow this route eastward through Clarence and Wheatland to DeWitt, at this point turning south via Eldridge to Davenport, making a run of 85 m. Crossing the river into Rock Island you will continue via Swedonia, Henderson, Galesburg, Maquon and Farmington to Peoria, the distance being 102 m. East from Peoria your way will lie through Tremont, Bloomington, Hoopeston, Oxford and LaFayette, 165 m.; thence through Frankfort, Lebanon, Indianapolis, Morristown and Rushville to Connersville, 124 m.

The Blue Book 4, covering the Middle West, will give you running directions for this trip with the exception of the portions from Marion to Davenport which will be found in volume 5.

El Reno, Okla.-Edna, Texas

Okeene, Okla.—Editor Motor Age—Can Motor Age furnish me a route and running directions between El Reno, Okla., and Edna, Texas? If not, please tell me where I can get them.—P. D. McClurg.

The Meridian road will serve you most of the way, El Reno being situated upon that thoroughfare, and your route will lie through Pocasset, Chickasha, Anadarko, Lawton, Burkburnett, Wichita Falls, Bowie, Fort Worth, Cleburne, Rainbow, Meridian, Valley Mills, Waco. From here you will route via San Antonio, traveling through the following towns: Lorena, Eddy, Troy, Temple, Holland, Granger, Georgetown, Austin, Kyle, Goodwyn, New Braunfels. Instead of going on to San Antonio you might go from this point to Seguin, thence to Belmont, Gonzales, Dilworth, Shiner, Yoakum, Cuero, Thomaston, Victoria, Telferner and Edna. Or, from Waco you might follow the other branch of the Meridian road via Marlin, Hammond, Hearne, Bryan, Navasota, Courtney, Hockley, Fairbanks, to Houston. From Houston your way will lie through Missouri City, Sugarland, Richmond, Rosenberg, Kenedon, Hungerford, Wharton, El Campo, Ganado, to Edna.

Blue Book 5 will give you running directions on this trip to San Antonio or to Houston, but from either of these points you will have to depend upon the routing given herein unless by local inquiry you may learn of improvements made on other roads since this information was gathered. The Blue Book may be secured from the Automobile Blue Book Publishing Co., 910 Michigan avenue, Chicago. The price is \$2.50.



Here's a suggestion for tourists who delight in collecting pennants as souvenirs of their trips. A Chicago motorist conceived the idea of utilizing his pennants in making a lap robe for the car, with the above result



From the Four Winds



ADOPT Green and White Tags—Green and white is the color combination of the 1914 Connecticut license tags. Pleasure cars will bear white markers with green letters. Manufacturers, dealers and liverymen will use a green marked with white letters.

After Violators of Motor Law—J. A. Shearer, Ohio registrar of motor cars, will soon send several detectives over the Buckeye state in order to detect and bring to justice a number of violators of the state motor law. One of the common violations is the transfer of number plates from an old to a new motor car.

Lowell Has Parking Spaces—Mayor O'Donnell of Lowell, Mass., has granted the request of the Lowell Automobile Club to allow some part of the city to be used for parking spaces and has prepared an ordinance and submitted it to the city council for adoption. It allows motorists to park their cars in the rear of the Market house on Market street, giving a large space to the purpose.

Boosting Dallas-to-Gulf Highway—Motor clubs of a number of towns along the route of the proposed Dallas-to-Gulf highway that is to be constructed between Dallas and Houston are actively assisting in the project. It is planned to form local organizations in the different counties through which the highway is to run and to promote the issuing of bonds for the construction of the different links that will go to make it up.

Club Formed in Attleboro—The Attleboro Motor Club was formed last week at that city by Secretary James Fortesque of the Massachusetts State Automobile Association. There are more than 400 motor cars owned in the city and a strong club will be the result, more than 100 now belonging to the association. Officers were elected as follows: Frank Mossburg, president; Dr. Ralph S. Kent, vice-president; John Valette, secretary-treasurer; Walter Kendall and William J. Luther, board of directors. It was planned to put the candidates for the Massachusetts legislature on record before the club endorses any of them this fall.

Notables Guests of Motor Club—During the coming winter the Manhattan Automobile Club of New York proposes to give several entertainments and dinners to notable men whose position, private or political, makes their views of general interest to the motor car trade. The guests of honor at the first dinner, to be held October 11, will be Maurice E. Connolly, president of the borough of Queens, and his highway superintendent, G. Howland Leavitt, two officials who were largely responsible for the excellent system of roads in the borough. Mayor Kline of New York, State Highway Commissioner Carlisle and Secretary of State May have also been invited to attend.

After Penn's O. K.—The campaign for the approval of the Pennsylvania \$50,000,000 good roads bond amendment to be voted on in November was launched in Harrisburg last Thursday with a rousing big convention of representative citizens of all parts of Pennsylvania. Governor John K. Tener, Supreme Court Justice John P. Elkin, Lieutenant-Governor John M. Reynolds, Senator William C. Sproul, author of the Sproul road act, and other speakers set forth clearly the imperative need of the bond issue to insure the construction of a modern system of good roads for the benefit of the present generation. Resolutions were adopted endorsing the loan, calling on Auditor General Powell to release \$1,800,000 of motor license money the legislature voted to road work, approving the

policy of national aid for the interest of all roads, and endorsing the project for a transcontinental road to be known as the Lincoln highway.

25,000 Cars in Texas Round-up—In the absence of any law requiring state registration of motor cars there are no reliable statistics available as to the number of these vehicles in use in Texas. It is estimated, however, that the number is close to 25,000, counting all kinds and classes of motor vehicles. Some estimates place the number as high as 35,000.

Ohio's Good Roads Increase—State Highway Commissioner J. R. Marker, of Ohio, recently issued a statement in which he stated that during the past 17 months 222.16 miles of improved road, under the direction of the state highway department, had been awarded and 140.79 miles completed. Prior to that, from the inception of the department in 1904, contracts for only 198.57 miles were let and 107.03 miles completed.

Select Grant Road Route—The selection of the route of the state-aid road to cross Jo Daviess county, Ill., and pass through Galena, Ill., the former home of General U. S. Grant, was made recently at a meeting of the county supervisors. The road will be 45 miles in length and will pass through Stockton, Woodbine, Elizabeth and Galena to East Dubuque. The highway will be built of macadam and form a link of the Grant road to be constructed across the northern counties of the state from Chicago to the Mississippi river.

Number Side Curtains; Stop Cussing—The Automobile Legal Association of Boston, Mass., says: "A very valuable suggestion has been made by a member of our association, which, it seems to us, has been overlooked by a large majority of motorists, and that is, that if the side curtains on the left side were numbered '1-L, 2-L, 3-L,' and those on the right side were numbered '1-R, 2-R, 3-R,' the putting up of side curtains quickly could be readily accomplished. These numbers could be put on with a little red paint which would do no harm and would doubtless save some 'cussing' in putting up the side curtains."

Demand Signboards—The good roads committee of the Lancaster Automobile Club, Lancaster, Pa., is on the trail of the supervisors who have been violating the law in not keeping signboards in proper places and in not removing loose stones from the road. An act of assembly requires the erection of signboards at all road intersections while another law requires the removal of all loose stones during the months of May, June, August and October. The committee has decided to make an inspection of the entire county, and where there are violations of the law the names of the supervisors will be handed to the club's attorney.

Black and White Tags for Badgers—Wisconsin motor vehicle license plates for 1914 will be done in black and white, according to the decision of the secretary of state, who is in charge of licensing and registration. The plate will be 5 inches high and 14 inches long, of white-enameled sheet metal, and will have black letters in relief, 4 inches high. In 1912 the plates were red with natural aluminum letters, and this year they are blue with aluminum letters. These plates cost the state 35 cents per pair, while the new plates will cost 36 cents. The Milwaukee firm which has the contract to furnish the plates has already started work on making 35,000 sets, the 1914 requisition. This is based on the anticipated registration

for 1913, which will run something more than 35,000. Already 33,750 licenses have been issued for the year 1913. The 1912 registration was nearly 26,000.

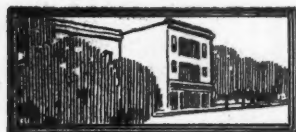
Trophy for Novel Motor Hunt—Members of the Long Island Automobile Club will ride to the hounds October 5 for the C. H. Galt trophy. The contest will be in the form of a motor hunt which will operate as follows: An unknown number of stations will be located within a specified district, each station to be indicated by a club flag. Members will have unlimited choice as to roads and the one finding the greatest number of stations will be declared the winner.

San Antonio Cards Race Meet—Prospects are very promising for a highly successful race meet at San Antonio, Tex., in November, the exact dates of the events yet to be fixed. The different committees that have the proposed meeting in charge are making good progress with the preliminary arrangements. It is planned to put up about \$5,000 in purses. The local business men are giving the event their support. President Hering is now in the east and expects to bring contracts with a number of drivers back with him.

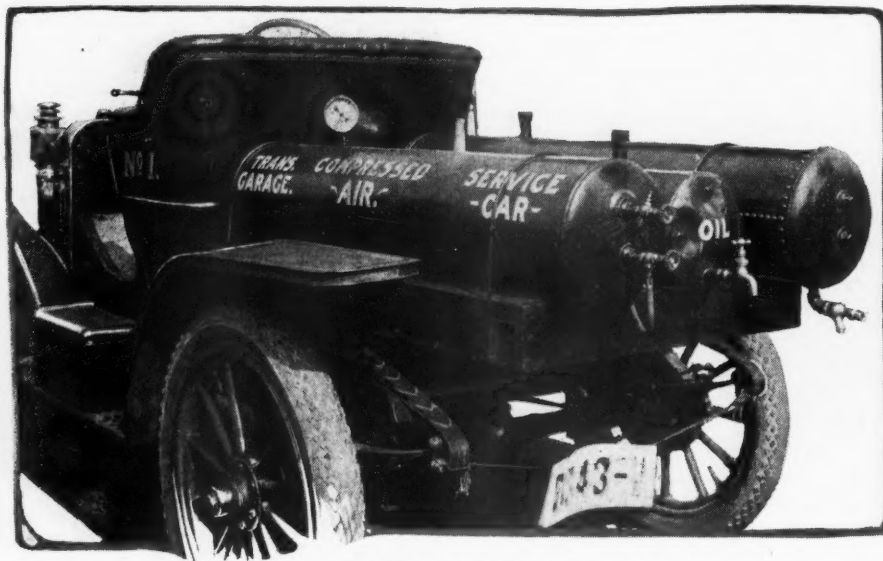
Heavy Penalty for Joy-Riders—The first prosecution of joy-riders under the new Wisconsin law which fixes a maximum money penalty of \$1,000 for using a motor car without the consent of the owner, occurred at Portage, Wis., last week. Orville Kruse and Earl Evans, 17 and 18 years of age, respectively, were arrested at Richland Center, Wis., in possession of a seven-passenger touring car which had been stolen from the private garage of J. A. Carroll of Portage. The boys plead guilty and were fined \$200 and costs each. Formerly the law provided a maximum penalty of \$50, but the last legislature made the offense somewhat more commensurate with horse stealing and fixed a penalty of \$1,000 in cash and 5 years in prison as a maximum penalty.

Wisconsin Favors Convict Labor—It is likely that convict labor will be applied to highway work in Wisconsin before the end of the present year. The board of supervisors of Racine county, which has just become active in permanent road work, and has appropriated \$75,000 for such work for the coming year, is so anxious to get started on grading the proposed concrete highways to be constructed next year that it has sent a petition to the governor asking that a band of convicts be given into its charge without delay. The governor, who is in favor of convict labor for highway work, intended to start loaning convicts to the various counties next spring as an experiment, but is likely to inaugurate the system at once. The Racine work consists principally of building that county's link in the Lake Shore drive from Milwaukee to Chicago.

Winding Up Delaware Season—The Wilmington Yacht and Automobile Club of Wilmington, Del., which has a clubhouse at Gordon Heights on the Delaware river just outside the city, is planning to close the season's activities on October 11 with a combination of events, one of the features being a motor car run. The destination has not been decided upon. There will also be a series of aquatic events, including a hydroplane race in which T. Coleman duPont's filer, the Tech, Jr., is expected to take part. Nearly all of the members are motorists and members of the Delaware Automobile Association.



Among the Makers and Dealers



A HANDY SERVICE CAR

The Transcontinental garage of Cedar Rapids, Ia., has made a service car out of a 1910 Moline. A platform has been built on the back, carrying three tanks. One tank contains compressed air for inflation of tires, another tank contains 5 gallons of lubricating oil, and the other tank contains 30 gallons of gasoline. The car is also equipped with jacks, tools, inner tubes, cane, and funnels and anything that a man in trouble is likely to need. The two valves on the end of the tank shown in the rear of the car are for filling from the larger tank and the bottom valve is connected to a hose for the inflation of tires.

CORNELL Joins Splitdorf Staff—Fred A. Cornell has joined the selling forces of the Splitdorf Electrical Co. of Newark, N. J.

New Plant for Bearing Maker—A \$25,000 factory building is to be erected in Toledo at the intersection of Phillips avenue and the Michigan Central tracks, for W. E. Bock, manufacturer of motor car bearings. The dimensions of the building will be 225 by 60 feet.

Howard Company to Expand—The Howard Motor Car Co. of Connerville, Ind., has increased its capitalization from \$10,000 to \$100,000 and with the increased capital expects largely to extend its activities. Frank B. Ansted has been elected general manager of the company. Heretofore the company's product has been taken wholly by Chicago and Los Angeles agencies, but new territory is to be opened during the 1914 season.

Pope Company Changes—A formal meeting of the stockholders of the Pope Mfg. Co. was held at the company offices this week to complete the winding up of the Pope Mfg. Co. of Connecticut which has been superseded by the Pope Mfg. Co. of Massachusetts. The change will have no effect upon the factory or the business of the company in Hartford, Conn. The action was entirely formal and taken in compliance of the law. The officers of the company in Hartford were the only ones to attend the meeting.

Making Cream Separator Speedometer—The Beloit works of the Stewart-Warner Speedometer Corp. are now producing numerous speed-recording devices in addition to instruments for motor cars. The latest application of the Warner device is a measuring device for cream separators. The instrument counts and shows the number of revolutions per minute and is so priced as to place it within reach of every dairyman. It is regarded as a boon to dairymen, who heretofore have been unable to operate the separa-

tors on the most economical and scientific basis possible because of the lack of the "speedometer."

Lozier Appoints Eastern Manager—Claude M. Logan has been made eastern representative of the sales department of the Lozier Motor Co., Detroit, with headquarters in Cleveland, O.

Hub Factory for Milwaukee—Stockholders in the Oshkosh Pneumatic Hub Co., organized recently at Oshkosh, Wis., to manufacture and market a pneumatic hub for motor car wheels, has under consideration an offer from Milwaukee capital to take over the invention and manufacture it at Milwaukee. The Oshkosh company is incorporated for \$20,000 and it is said the Milwaukee offer

carries with it \$20,000 in cash and an equal amount of stock in a \$100,000 corporation which it is intended to organize. A decision will be reached within a few weeks.

Columbus Adopts Service System—The Columbus Buggy Co. of Columbus, O., advertises that it will give free factory service to all purchasers of electric and gasoline cars made by the company. This service includes washing, polishing, charging batteries and making adjustments and minor repairs.

Rubber Company Elects Officers—The Bowling Green Rubber Co. of Bowling Green, O., has been organized by the election of the following officers: Charles W. Green, Toledo, president; M. L. Cope, Akron, general manager, and Mont Clouse, Bowling Green, secretary-treasurer.

Bradford U. S. Sales Manager—C. C. Bradford, formerly manager of the Cleveland branch of the United States Light and Heating Co., has been promoted to sales manager of the company with offices at 30 Church street, New York. R. B. Clark, with the title of acting manager, succeeds Mr. Bradford at Cleveland.

New Factory for Spark Plug Maker—A permit has been granted for the erection of a new factory building for the Champion Spark Plug Co., at Avondale and Upton avenues, Toledo, O., to cost \$24,000. The building will be four-story, concrete, with steel cash and daylight effects and will have a ground space of 60 by 120 feet.

Swinehart Increases Capital Stock—Three new directors were elected recently by the stockholders of the Swinehart Tire and Rubber Co., Akron, Ohio. They are Fred H. Snyder, Massillon, O., Charles Curry, Akron, and T. E. Barry, Akron. Oliver Toomey, of Canal Dover, and T. E. Borton, Cleveland, declined renomination. The directors voted an increase of \$200,000 in the capitalization, making it a million-dollar corporation.

Stoddard Tire Makes Debut—The first tire factory to start operations in Worcester, Mass., began the manufacture of tires there last week when Charles H. Stoddard began producing what will be known as the Stoddard tires. He has his factory at Exchange and Commercial streets. The production at first will be small compared with what other factories are doing, but he hopes to increase it to a good figure within a short time. For

Coming Motor Events

October 3—Track meet, Trenton, N. J.
October 3-4—Track meet, Oklahoma City, Okla.
October 4—Track meet, Fresno, Cal.
October 4—Track meet, Providence, R. I.
November 2-3—Los Angeles-Phoenix road race.
November 4-5—Road race, El Paso, Tex., to Phoenix.
November 6—Track meet, Phoenix, Ariz.
November 24—Vanderbilt road race, Savannah, Ga.
November 27—Savannah grand prix.

*Sanctioned by A. A. A.
†Sanctioned by A. C. A.

SHOWS, CONVENTIONS, ETC.

September 29-October 4—American road congress, Detroit, Mich.

October 6-18—St. Louis show.
October 15-25—Electric show, Grand Central palace, New York city.
October 17-27—Paris show.
October 18-November 2—Dallas, Tex., show.
October 21-24—Trans-Mississippi Commercial Congress, Wichita, Kan.
October 22-27—Omaha show.
October 27-28—Convention Electric Vehicle Association of America, Chicago.
November 7-15—Olympia show.
December 9-12—Annual convention of American Road Builders' Association, Philadelphia.
December 11-20—First International Exposition of Safety and Sanitation, New York city, American Museum of Safety.
January 2-10—Importers' Automobile Salon, Hotel Astor, New York.
January 3-10—New York show, Grand Central palace.
January 24-31—Rochester, N. Y., Show.
January 24-31—Chicago show.
January 26-31—Scranton, Pa.
January 31-February 7—Minneapolis show.
February 2-7—Buffalo passenger car show.
February 9-14—Buffalo truck show.
February 21-28—Newark, N. J.
February 22—March 5—Cincinnati, O.
March 7-14—Boston passenger car show.
March 9-14—Show at Des Moines, Ia.
March 17-21—Boston truck show.

several years Mr. Stoddard has been in the tire business and served through all the grades, spending some time at one of the Akron factories.

Will Increase Output of Trucks—The Commerce Motor Car Co., maker of a ½-ton truck, has decided to greatly increase the output of its Detroit factory in order to supply the 1914 demand.

Culver Makes a Change—Charles R. Culver, who has been with the Knox Automobile Co. of Springfield, Mass., for many years, has resigned to become sales manager of the Stoddard Motor Car Co. of that city, agent for the Pierce-Arrow.

Paxson to Distribute Ohios—C. D. Paxson, 1900 Euclid avenue, Cleveland, O., has completed arrangements with the Crescent Motor Co. of Cincinnati, O., maker of the Ohio, to take charge of the entire output and sales of the latter's product.

Jiffy Moves to Larger Quarters—The Jiffy Auto Curtain Co. of Detroit has moved from the Ford building to the Dodge Power building in order to secure larger quarters. At a recent meeting of the board of directors, President Frank Ilse was extended a 4 months' leave of absence to permit him to go to Europe. Mr. Ilse has been in poor health for the past year.

Heavy Demand Necessitates Change—To meet the growing demand for its product and to increase its output, the Spicer Mfg. Co. of Plainfield, N. J., maker of universal joints, will operate its plant 6 days a week instead of 5 as heretofore. The completion of a new plant at South Plainfield will make it possible for the company to add to its present line in the new future.

New Motor Show Manager—At a meeting of the Rhode Island Automobile Dealers' Association last week, Percival S. Clark, manager of the Mitchell Auto Co. of Providence, was appointed business manager of the organization and will have full charge of all matters in relation to the motor shows held by the association, succeeding Arthur S. Lee. The show will be held in January at Providence following the New York show.

Packard Changes in the East—Charles G. Embleton, for the past 4 years manager of the Hartford, Conn., Packard branch, has also assumed charge of the Springfield, Mass., branch, dividing his time between both cities. George A. Mevis, formerly manager of the truck department of the Knox in Springfield, and later with the Hartford Packard branch, has gone to Springfield to replace Mr. Hickman, recently transferred.

Recent Incorporations

Boston, Mass.—Boston Prest-O-Seal Co., capital stock, \$20,000; motor car business; incorporators, W. G. Todd, M. T. Hubbard, W. G. Todd.

Bridgeport, Conn.—Moon Sales Co., capital stock, \$15,000; motor car business; incorporators, B. Sachs, H. H. Drucker, S. B. Drucker.

Chicago—Automobile Realization Co., capital stock, \$90,000; incorporators, F. T. Righeimer, M. W. Bigelow, F. T. Murray.

Chicago—Paul Wargney & Co., capital stock, \$2,500; to deal in motor cars, etc.; incorporators, C. G. Mueller, P. Wargney, S. B. Meyer.

Chicago—Ross Sleeve Motor Co., capital stock, \$20,000; to deal in motors; incorporators, I. A. Morrison, C. F. Taylor, E. Hoobler.

Cleveland, O.—Cleveland Rotary Motor Co., capital stock, \$10,000; to manufacture and deal in rotary motors; incorporators, P. Schwan, Jr., C. N. Neubrand, K. L. Mach, A. T. Daniels, J. L. Lind.

Cleveland, O.—Standard Auto Equipment Co., capital stock, \$10,000; to deal in motor cars; incorporators, W. Houghm, E. Davis, J. Armstrong, P. J. Nutley, F. W. Gillette.

Cleveland, O.—Metropolitan Garage Co., capital stock, \$5,000; to manufacture and deal in motor cars and conduct garage; incorporators, C. Mulvahy, H. C. Quigley, H. Loeb, W. I. Quigley, M. Schwab.

Cleveland, O.—Leader Brass Foundry and Manufacturing Co., capital stock, \$10,000; to deal in brass goods; incorporators, F. W. Ficht, H. W. Ficht, F. W. Ficht, Jr., A. H. Meyer, A. Ficht.

Columbus, O.—Columbus Polish Co., capital stock, \$10,000; to manufacture and deal in polishes; incorporators, J. B. Baas, C. Baas, A. J. Heider, E. Hoppe, E. Baas.

Dover, Del.—Michigan Motor Car Co., capital stock, \$1,000,000.

Detroit, Mich.—Flyer Motor Car Co., capital stock, \$100,000; incorporators, G. A. Milne, A. A. Gloetzer, H. W. Campbell.

Duluth, Minn.—Resilient Auto Wheels Co., capital stock, \$50,000; incorporators, A. Jutilla, H. Johnston, O. Thompson, A. W. Youngkivist, B. E. Welberg.

Floresville, Tex.—M. A. Newman Garage Co., capital stock, \$5,000; incorporators, J. E. Dewees, M. A. Newman, J. H. Brown.

Green Bay, Wis.—Green Bay Oil & Gas Co., capital stock, \$30,000; incorporators, T. D. Silverwood, John Fredericksen, G. Snively.

Hartford, Conn.—Donegan Auto Body and Specialty Co., capital stock, \$21,000; incorporators, W. R. Donegan, J. J. Walsh, L. S. Risley.

Hempstead, N. Y.—London Limousine Co., capital stock, \$10,000; detachable bodies; incorporators, J. McAvoy, C. U. Stowe, A. M. Stowe.

Huntington, W. Va.—Modern Garage, capital stock, \$5,000; to operate garage and agency; incorporators, B. G. Frampton, W. D. Adams, B. C. Cain, E. M. Cain, M. V. B. Adams.

Los Angeles, Cal.—Atlas Tractor Co., incorporators, C. Sangster, E. E. Elliot, J. A. Tuthill, C. W. Snyder.

Charles Grossman has been sent to the Long Island City service station and his place as manager of the repair and service department has been taken by J. J. Meade. George

Marion, O.—Marion Motor Car Co., capital stock, \$10,000; to deal in motor cars; incorporators, G. D. Copeland, G. B. Schofield, E. B. Durfee, W. E. Schofield, J. W. Thew.

New York—G. B. Garage & Mfg. Co., capital stock, \$50,000; incorporators, S. C. Sammis, L. B. Haft, R. L. Vandewater.

New York—Premier Auto Novelty Mfg. Co., capital stock, \$15,000; motor car accessories; incorporators, H. G. Kosch, H. Cohen, C. Welland.

New York—Ritz Cyclecar Co., capital stock, \$10,000; to repair cars; incorporators, A. T. Maurice, A. Spotswood Campbell, D. B. Murray.

New York—Packard Exchange, capital stock, \$500; motor car business; incorporators, L. G. Duquet, T. F. MacMahon, L. E. Lawrence.

New York—Phelps Motor Car Corp., capital stock, \$50,000; incorporators, F. L. Sanford, E. H. Craw, H. A. Biggs.

New York—Progressive Taxicab Co., capital stock, \$500; incorporators, H. Ackerman, A. Schwartz, B. Ackerman.

New York—Premier Auto Novelty Mfg. Co., capital stock, \$15,000; to deal in motor car accessories; incorporators, C. Wieland, H. Cohen, H. G. Kosch.

New York—S & K Tire Co., capital stock, \$10,000; incorporators, H. Senner, B. S. Kaplan, J. J. Coomber.

Pharrie, Tex.—Relo Grande Auto Inn, capital stock, \$10,000; livery and transfer business; incorporators, A. J. McCall, H. F. Best, G. E. Gage.

Philadelphia, Pa.—Automobile Development Co., capital stock, \$10,000; to manufacture and deal in motor cars.

Philadelphia, Pa.—Colonial Motor Co., capital stock, \$20,000.

Pittsburgh, Pa.—Willias Hasley Motor Car Co., capital stock, \$15,000; incorporators, S. Hasley, S. A. Williams, W. G. Hasley.

Pittsburgh, Pa.—Williams, Hasley Motor Car Co., capital stock, \$15,000; incorporators, S. Hasley, S. A. Williams, W. G. Hasley.

Pittsburgh, Pa.—Voorhees Rubber Mfg. Co., capital stock, \$10,000; incorporators, F. W. Succop, J. M. Milholland, J. H. McNamee.

Pontiac, Ill.—Pontiac Motor Car Co., capital stock, \$35,000; incorporators, I. A. Morrison, C. F. Taylor, E. Hoobler.

Providence, R. I.—Goodwin-Sherman Motor Car Co., capital stock, \$25,000; incorporators, C. H. Goodwin, C. A. Sherwin, W. J. Ford.

Salem, Mass.—Loring Avenue Garage Co., capital stock, \$5,000; incorporators, G. P. Brooks, G. H. Brooks, A. R. Slee.

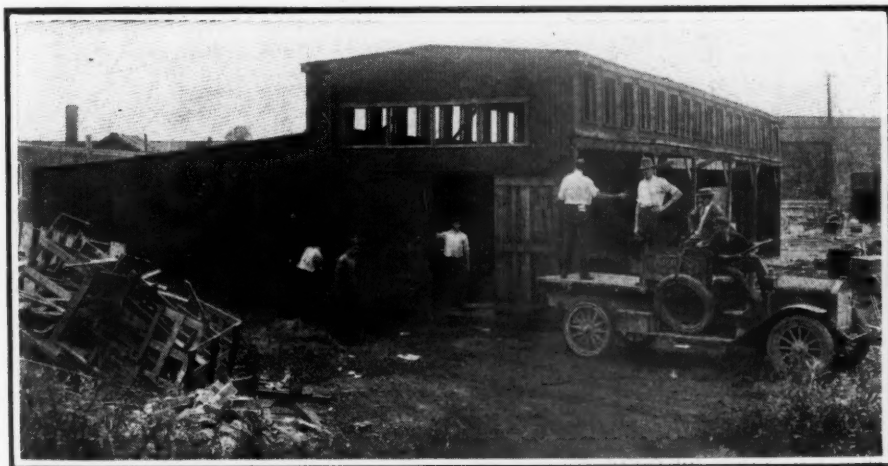
San Antonio, Tex.—Texas Motor Car Co., capital stock, \$10,000; incorporators, W. H. Smith, M. Trice, S. Burg.

Springfield, Ill.—L. Markle Co., capital stock, \$40,000; to manufacture motor vehicles, parts and accessories; incorporators, E. C. Wetten, J. E. Rommell, H. M. Doyle.

Toledo, O.—Auto Distributing Co., capital stock, \$10,000; to deal in motor cars; incorporators, W. G. Kirkbridge, L. M. True, J. L. Bayless, N. L. Nayless, D. W. Parker.

Toledo, O.—Jefferson Avenue Gasoline & Supply Co., capital stock, \$1,000; to deal in retail and wholesale gasoline, and motor cars; incorporators, J. A. Ewing, R. W. Bowers, R. D. Logan, L. J. Hennesy, L. Bergman.

Wauwatosa, Wis.—Surburban Garage Co., capital stock, \$11,000; incorporators, A. D. Warren, P. G. Warren, D. A. Krienitz.



BROWN TRUCK MOVING A BUILDING.

Many uses to which a motor vehicle have been put have been shown, but it remained for the Brown Commercial Car Co. of Peru, Ind., to put a truck to the task of moving a building. Desiring to move a temporary test shed 45 by 29 feet, to a more convenient point, the building was jacked up, put on rollers and then a Brown 1500-pound delivery wagon was hooked up and in a very short time the building was in place.

T. Beck has been shifted from Hartford to Springfield as chief tester.

Mitchell Officials Form Sales Company—Frank L. Mitchell, treasurer, and Otis C. Friend, sales manager of the Mitchell-Lewis Motor Co., Racine, Wis., have organized a sales organization under the style of Mitchell-Lewis Co. of Racine, with \$10,000 capital. William H. Armstrong, assistant secretary, also appears as an incorporator.

Sudrow Southern Sales Manager—F. G. W. Sudrow, who, for the past year has been identified with the Marion Motor Car Co. in the capacity of sales manager, has been made division manager for Marion cars in the southern states. This appointment is announced by the J. I. Handley Co., Indianapolis, Ind., selling agent for Marion and American cars.

Electric Motorette Maker Retires—C. W. Kelsey of Hartford, Conn., who for some time past has devoted his attention to electric motorettes, has announced his retirement from the manufacturing field. He was the prime mover in the organization of the C. W. Kelsey Co. about 3 years ago. That concern experienced financial difficulties and went into receiver's hands. The receiver some time ago instituted suit against the Lycoming Foundry and Machine Co. which has not yet been decided. Kelsey later bought the stock of parts and vehicles and for a time devoted his attention to building the three wheelers. He announces no plans for the future.



Brief Business Announcements



Recent Agencies Appointed by Motor Car Manufacturers

PASSENGER CARS

Town	Agent	Make	Town	Agent	Make
Ashland, O.	Ashland Auto Garage	Oakland	Lima, O.	E. A. Bleck	Oakland
Atlanta, Ga.	G. W. Hanson	Oakland	Lisbon, O.	L. E. Miller	Oakland
Blue Earth, Minn.	Quiggle Brothers	Oakland	Little Rock, Ark.	G. L. Hoffman	Oakland
Boston, Mass.	King Motor Car Co.	King	Livingston, Wis.	A. T. Spang Auto Co.	Oakland
Bucyrus, O.	Bucyrus Cycle and Auto Co.	Oakland	Los Angeles, Cal.	Hawley King & Co.	Oakland
Cedar Rapids, Ia.	H. I. Bunting	Oakland	Los Angeles, Cal.	Greer-Robbins Auto Co.	Hupmobile
Chagrin Falls, O.	W. C. Wait	Oakland	Marion, O.	Newton H. Davis	Ford
Charlotte, Ia.	Charlotte Auto Co.	Oakland	Marion, O.	Gunder & Miller	Cole
Chelsea, Mich.	McLaren & Freeman	Oakland	Milwaukee, Wis.	Creek Motor Sales Co.	Oakland
Chicago	R. A. Wadsworth & Co.	Oakland	Milwaukee, Wis.	R. D. Rockstead	Paige
Clinton, Mich.	Clintonian Garage	Oakland	Milwaukee, Wis.	Schwarzburg-Mack Auto Co.	Empire
Clyde, O.	R. W. Glick	Oakland	Milwaukee, Wis.	Schwarzburg-Mack Auto Co.	King
Columbus, O.	F. E. Avery	Packard	Milwaukee, Wis.	Schwarzburg-Mack Auto Co.	Oakland
Columbus, O.	Barr Motorcycle Co.	Franklin	Napoleon, O.	Corey Brothers Auto Sales Co.	Oakland
Columbus, O.	Oscar Lear Motor Co.	Oakland	New Canton, Ill.	G. H. Dudely	Metz
Columbus, O.	D. W. Short	Metz	New York	Sidney B. Bowman Auto Co.	Oakland
Defiance, O.	E. B. McClary	Oakland	Oskaloosa, Ia.	D. P. McClure	Oakland
Des Moines, Ia.	Bothne Auto Co.	Nyberg	Patterson, N. J.	Model Garage and Auto Co.	Oakland
Des Moines, Ia.	Des Moines Imperial Co.	Imperial	Peoria, Ill.	M. G. Smith	Oakland
Des Moines, Ia.	Knowles McCallum Co.	Colby	Pittsburgh, Pa.	Forbes Motor Car Co.	Maxwell
Des Moines, Ia.	Swanson-Christianson Auto Co.	Patterson	Port Clinton, O.	D. K. McRitchie	Oakland
Des Moines, Ia.	Ideal Auto Co.	Oakland	Portland, Me.	Franklin Motor Car Co.	Franklin
Dixon, Ill.	Moeller & Wilson	Oakland	Salem, Mo.	M. H. Phelton	Metz
E. Orange, N. J.	Oakland Motor Sales Co.	Oakland	Sandusky, O.	George J. Bing	Oakland
Fayette, O.	H. A. Pawling	Oakland	Shreveport, La.	Leo Gunning	Oakland
Findlay, O.	Auto Sales Co.	Oakland	Springfield, Ill.	G. D. Smith	Oakland
Fostoria, O.	Smith & Shuman	Oakland	St. Louis, Mo.	Todd Auto Co.	Richmond
Hartford, Conn.	Dillon Court Garage	Stutz	Tacoma, Wash.	Union Motor Car Co.	Chandler
Indianapolis, Ind.	W. J. Fitton and W. E. Jackson	Partin-Palmer	Toledo, O.	Baumgardner & Kibby	Oakland
Indianapolis, Ind.	C. A. Chambers Co.	McFarlan	Tuckahoe, N. J.	C. E. Stille	Oakland
Jackson, Miss.	Capitol Auto Co.	Oakland	Urbana, O.	W. N. Couffer	Oakland
Kansas City, Mo.	Bruening Brothers Auto Co.	Ford	Vancouver, B. C.	Maritime Motor Co.	Case
Leipsic, O.	Dal Kirk	Herreshoff	Wabash, Ind.	Oakland Sales Co.	Oakland
Leipsic, O.	Dal Kirk	Hupmobile	Washington, D. C.	Zell Motor Car Co.	Reo
Leipsic, O.	Dal Kirk	Oakland	Waterloo, Ia.	Waterloo Auto & Supply Co.	Oakland
Leipsic, O.	Dal Kirk	Paige	Xenia, O.	Martin H. Schmidt	Buick

COMMERCIAL CARS

Boston, Mass.	Atterbury Boston Co.	Atterbury	Indianapolis, Ind.	McFarlan Six Sales Co.	Federal
Bridgeport, Conn.	D & H Auto Distributing Co.	Koehler	Shreveport, La.	Buckelew Hardware Co.	Koehler
Bridgeton, N. J.	W. M. Shepard	Koehler	Stamford, Conn.	Fred Smith	Koehler
Chicago	Centaur Motor Co.	Jeffery	Syracuse, N. Y.	A. J. Jackson	Republic
Indianapolis, Ind.	McFarlan Six Sales Co.	Standard			

Boston, Mass.—The Gibney Tire and Rubber Co. has opened a branch on Brookline street, Boston.

Westfield, Wis.—Michael Haney has broken ground for a \$9,000 garage and repair shop building for the Quinn & Clark Motor Co., agent for the Ford at Westfield.

Kansas City, Mo.—The Bruening Bros. Automobile Co., Thirty-sixth street and Broadway, will hereafter handle Ford cars in connection with the Apperson and the Waverley electric.

Tacoma, Wash.—W. P. Wotton and Karl Martin, formerly connected with the Automobile Supply Co. in Tacoma, have opened the Olympia Auto Supply Co. at Fifth and Main streets, in the Capital city.

Watertown, Wis.—G. H. Hafemeister has disposed of his interest in the G. H. Hafemeister Motor Co., Watertown, Wis., district agent for the Ford, to Fred Klinger and Edward Radloff, who will continue the business and agency under the name of Klinger & Radloff.

Pittsburgh, Pa.—Motor Square Garden, formerly the East Liberty market house building, which has been used for several motor shows in Pittsburgh, has been taken over by the Automobile Dealers' Association. The place will be known as the Automobile Exchange, for the cars taken in trade by the association dealers. This arrangement will save money for both dealer and customer, it is declared. W. H. LaFountain will manage the new enterprise. Cars of every make and kind will be on exhibition, as well as trucks and fire apparatus, patrols and the like.

Beloit, Wis.—H. A. Day and Albert Hansen have formed a partnership and will erect a garage and repair shop in this city shortly.

Boston, Mass.—The King Motor Car Co. of Detroit has added another branch to its chain in New England by opening salesrooms in Boston at 1029 Boylston street.

Boston, Mass.—The Endurance Tire and Rubber Co. has opened a branch in Boston, Mass., on Boylston street, and John L. Hamilton, for 8 years with the Eagle Oil Co., is the manager.

Hartford, Conn.—John W. Kemp of the sales staff of the Hartford Goodyear branch has secured a half interest with F. L. Caulkins & Co. of Middletown in the Hartford representation of the Chalmers.

Seattle, Wash.—James P. Scarse has been made manager of the factory branch of the Metz Co. established in Seattle, which will be the distributing center for the Pacific northwest states and the province of British Columbia.

New Orleans, La.—The Abbott Automobile Co., agent for the Packard in New Orleans, is erecting a building of its own. The new structure, specially designed for the handling and display of motor cars, will be ready for occupancy late in the fall.

Boston, Mass.—William I. Colt, of the Colt-Stratton Co. of New York, has been in Boston looking over the details of the changing of the agency there, which now becomes a part of the New York firm, the Habich Co. having relinquished the agency. The new organization is known as the Cole Motor Co. of Boston and has salesrooms on Massachusetts avenue and service station on Bickerstaff street.

G. E. Habich and Conrad Smith remain with the new company, but H. J. Habich has resigned.

Philadelphia, Pa.—Howard M. Plowman has been appointed manager of the Philadelphia branch of the Invader Oil Co.

Galveston, Tex.—The H. W. Johns-Manville Co., of New York, maker of insulating materials and electrical systems for motor cars, has opened a branch in Galveston.

Seattle, Wash.—Bert Stevens, advertising man on the Firestone staff, recently moved to Seattle and will have charge of the advertising for the Firestone Tire and Rubber Co. in the northwest.

San Francisco, Cal.—Henry L. Hornberger has again entered the motor car field in San Francisco and is to be northern California representative of the Palmer-Singer, Borland electric and Brown commercial vehicle.

Boston, Mass.—The Whitten-Gilmore Co., agent for the Chalmers and Woods electrics, has moved into its new building on Commonwealth avenue, where it will occupy half the basement and first two floors and the entire third floor.

Syracuse, N. Y.—A. J. Jackson, a local truck dealer, has recently added the Republic truck to his line of commercial cars. Mr. Jackson has purchased the Cronin garage at 571-577 South Clinton street, previously occupied by the Cronin Automobile Co.

Toledo, O.—The Ford Bros. Auto Sales Co., 1216-20 Madison avenue, assigned recently to John M. McCabe of Toledo. The deed of assignment was signed by Guy R. Ford as president and Margaret A. Ford as secretary. Assets of the company were given as \$5,000, \$4,800 of this being personal property and \$200 real estate. Ford said his company was forced to assign through the



failure of the Michigan Buggy Co., at Kalamazoo, Mich., for which the local concern was distributor.

Kenton, O.—William Herr, formerly of Prospect, O., has purchased the Porter garage on West Franklin street, Kenton, O.

Kansas City, Mo.—O. H. Schneider has succeeded Bright & Schneider in the business at 1601 Grand avenue. He is now the local agent for the Wayne tanks and storage system.

Providence, R. I.—The J. T. Stubbs Co., Rhode Island distributor for the Henderson and National cars, with headquarters at Providence, has moved into new salesrooms at 78 Mathewson street.

Chicago—October 1 the Woods Motor Vehicle Co. opened a direct factory branch in Peoria. W. E. Johnston has been appointed manager. He will also act as the company's district manager for central Illinois.

Indianapolis, Ind.—E. T. Klee has been appointed manager of the truck department of the Gibson Auto Co., which has taken on the Garford and Willys-Utility. Mr. Klee has been associated with the Mais Motor Truck Co.

Boston, Mass.—William F. Fewell, formerly manager of the Oldsmobile branch in Boston, and later with the Oakland in New York, has returned to Boston, to take charge of the Oakland branch in that city following the resignation of Fred Walsh, who goes to the Pacific coast.

Milwaukee, Wis.—The Wisconsin Automobile Radiator Co., of North Milwaukee, which established a radiator factory 3 years ago, has opened a factory branch office in the city of Milwaukee, at 536 East Water street. The branch will attend to the wants of motorists for repairs and new radiator construction.

Hartford, Conn.—F. L. Caulkins & Co., of Middletown, who has the Chalmers agency for Hartford county, has secured the quarters on Ann street occupied by Skinner Brothers, the former Chalmers representatives. The Stevens-Duryea branch in the adjoining store has leased the basement of the Chalmers salesrooms and will extend the repair department.

Cleveland, O.—The F. B. Stearns Co., of Cleveland, manufacturer of Stearns-Knight cars, has incorporated its Philadelphia and Los Angeles branches, the former being now known as the F. B. Stearns Co. of Philadelphia, and the latter as the F. B. Stearns Co. of California, the headquarters of the latter branch having been moved from San Francisco to Los Angeles.

Seattle, Wash.—Herbert Wilson of Seattle, special factory representative of the Cartercar Co., has made a deal by which the Moline Plow Co. takes over the distribution rights for the Cartercar. This company has branches in Los Angeles, Stockton, San Francisco, Portland, Spokane, Boise, Ida., and Phoenix, Ariz. J. W. Prescott, formerly of Spokane, will have charge of the Seattle house.

San Francisco, Cal.—The Pathfinder company of Indianapolis has enlarged its selling organization by means of the newly organized Pathfinder-Pacific Motor Sales Co. of San Francisco. The Pathfinder Motor Car Co. of Los Angeles, which formerly maintained the agency at San Francisco, is concentrating all of its efforts on the territory in southern California, and will maintain exclusively its branch at Los Angeles. The San Francisco agency has installed an elaborate service department and has on hand \$10,000 worth of extra parts. The service end of the northern California business is under the direction of John D. Stall. The new company will retain its quarters at Fresno, Watsonville, Oakland and Sacramento, and will establish service stations



in all parts of the state and also will have a branch in the Hawaiian Islands and Reno, Nev.

Indianapolis, Ind.—Ray Harroun has opened a display and salesroom at 527 North Capitol avenue for the Harroun kerosene carburetor.

Los Angeles, Cal.—A. S. Robinson has been made manager of the Kisselkar agency in Los Angeles. He succeeds E. Roger Stearns, who was killed in an accident some weeks ago.

Pittsburgh, Pa.—C. H. Martin, formerly manager in Pittsburgh for the Premier Motor Car Co., has taken up the work of local sales manager for the H. J. Lange Motor Car Co., maker, principally, of motor trucks.

Boston, Mass.—The George Grow Automobile Co., dealer in used motor cars and trucks, has moved to new and larger quarters in the five-story brick building formerly known as the Electric garage, at 321-323 Columbus avenue.

Kansas City, Mo.—The Rauch & Lang Carriage Co. has opened a direct factory branch at 3501 Main street, under the management of R. C. Kage. The new building is 74 by 120 and has a complete service station and battery room for electrics.

Cleveland, O.—The Pollock Tire and Supply Co., dealer in accessories and special outfitters for the Ford car, has just taken the exclusive agency in Cleveland of two new attachments, the Hans gasoline gauge and the Hans crankcase oil lever gauge.

Milwaukee, Wis.—The Billings Auto and Tire Supply Co. has opened its new supply store at 181 Fourth street, Milwaukee, and will do a wholesale and retail business in supplies, accessories, tires and tire supplies. Gordon P. Jahn has been appointed manager.

Boston, Mass.—J. R. Bradford, sales manager of the M-B-M Co., handling the Maxwell and Wagenhals line, has resigned to accept a position with the Wagenhals factory as its representative on the Pacific coast, and has started for the factory to complete arrangements.

Indianapolis, Ind.—Within a short time a factory sales branch of the Ajax-Grieb Rubber Co. will be opened in Indianapolis, according to S. H. Pierce, a special representative of the company, who has been investigating the feasibility of opening a branch in this city.

Indianapolis, Ind.—About 100 Indiana Buick dealers and their mechanics attended a school of instruction in Indianapolis, September 16 and 17. The school was conducted in the factory sales branch of the Buick Motor Co., and E. T. Strong, manager of the branch, was host for the visitors, entertaining them at the Denison hotel.

San Francisco, Cal.—Several changes have been made in the Reo-Pacific Co. of San Francisco. Hereafter the San Francisco branch will be in charge of L. A. Renniff, while C. W. Hobson, formerly of Fresno, will act as retail sales manager. Norman DeVaux, general manager of the company, expects his duties to keep him on the road.

Milwaukee, Wis.—The Creek Motor Sales Co., 228-232 Wisconsin street, Milwaukee, Wisconsin state agent for the Oakland, Empire and King, will move into more commodious and elaborate quarters on October 15, having taken a long-term lease on the whole of the new garage building erected by Patrick Cudahy at 447-449 Jackson street. The company will henceforth devote its entire attention to the wholesale business, having turned over the Milwaukee city retail business to

the newly organized firm of Schwarzburg-Mack Auto Co. of Milwaukee. The new firm will have quarters at the Creek garage and will operate a service station in connection with the large repair shop. R. A. Schwarzburg and J. J. Mack are behind the enterprise.

Seattle, Wash.—The R. W. Abbott Motor Car Co. is the latest on Seattle's motor row, R. W. Abbott having purchased recently the Arthur Bunker Motor Car Co.

Seattle, Wash.—W. M. Brinker, for the past few years Apperson agent in Seattle, has retired from the business. D. C. Guichard will remain temporarily in charge of the line.

Boston, Mass.—J. H. Mack, formerly with the Boston Alco branch, has taken a position with the Autocar branch in that city as supervisor of sub-agencies that he is forming throughout New England.

Hartford, Conn.—John Roach, for many years superintendent of the painting department of the Columbia Motor Car Co., has planned to open a shop of his own on Maple avenue, Hartford, Conn.

Wauwatosa, Wis.—The Suburban Garage Co. has been organized at Wauwatosa to establish a garage and repair shop. A. D. and P. G. Warren and D. Krienitz are the owners. The corporation has a capital of \$11,000.

Natchez, Miss.—A loss of \$12,000 was sustained by the Natchez Auto and Supply Co. when its garage was destroyed by fire last week. In addition three cars, in the garage for repairs, were burned. A number of machines were saved.

Boston, Mass.—The Endurance Tire and Rubber Co. of New York is to open a New England branch with headquarters in Boston, and John L. Hamilton, formerly with the Eagle Oil and Supply Co. in this city, has been appointed manager.

Milwaukee, Wis.—H. J. Fischer, assistant manager of the Milwaukee branch of the Firestone Tire and Rubber Co., has been appointed advertising manager for Wisconsin and will devote his time in general promotion work in this territory.

Cleveland, O.—In erecting the four-story building at 1925 Euclid avenue for the use of the Cleveland Cadillac Co. as a salesroom and service station, foundations are being put in for an eight-story structure, which eventually will be required by the Cadillac people.

Kansas City, Mo.—The Great Western Motor Co., handling the Great Western line, is now located at 1805 McGee street. Donald Laster is the manager. The company will maintain a service station. Its territory includes western Missouri, Arkansas, Kansas and Oklahoma.

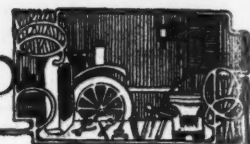
Milwaukee, Wis.—E. C. Frady has been appointed manager of the Milwaukee branch of the Cole Motor Co. to succeed W. J. Haughey, who has gone to Denver to become associated with a large motor car concern. The Milwaukee branch is located at 188 Eighth street.

Boston, Mass.—L. C. Harmon, until recently sales manager of the Myer Abrams Co. of Boston, New England distributor of the Lauth-Juergens trucks, is now sales manager of the newly formed Atterbury Boston Motor Truck Co. that has temporary salesrooms on Blue Hill avenue, Boston.

Seattle, Wash.—The surprise of the past week in Seattle trade circles was the resignation of George W. Miller, manager of the Seattle branch of the Winton Motor Car Co., after 11 years of service. He has retired from business for a much needed rest and will shortly sail for the orient. A. G. Shaefer, who has been Mr. Miller's assistant, is at present acting as manager.



The Motor Car Repair Shop



MANY motorists are backward in taking off the magneto, because they are afraid that it is difficult to put it back in position correctly, but the operation is so simple that the taking off and putting back of this member should not scare one. Let us suppose that the magneto has been taken off a four-cylinder motor and laid on the bench and in the meantime someone has turned the motor over a few times.

Remove the distributor board so that the distributor arm is visible and then with the hand turn the armature around until the distributor arm is on segment No. 1. At some time during the passage of the distributor across the segment the breaker points of the magneto will open. Set the breaker box in retard position. Revolve the armature with the hand until the points just begin to open. That is, move the armature until the points are fully open and then push the armature back a little. At this point the magneto is ready to send a spark to No. 1 cylinder. The next step is to make No. 1 cylinder ready to receive the spark. Turn the motor over until No. 4 exhaust valve is fully open and compression can be felt on No. 1 cylinder. By holding the hand over No. 1 petcock, which should be open, one can feel the gas coming out. With No. 4 exhaust valve fully open and No. 1 cylinder on the compression stroke, and the flywheel on dead center mark, the magneto may be slipped into place.

Replacing Motor Plugs

In replacing cylinder and crankcase plugs and, in fact, all plugs about a motor car care must be taken to get these in position tightly, for if not done properly much harm may be done. Take, for example, the oil drain plugs which are inserted in aluminum crankcases. Very often these are not drawn up tight enough

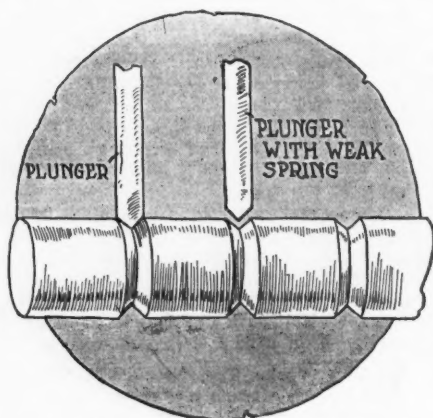


FIG. 1—SHIFTER LEVER DROPS OUT OF SPEED

Cause shown above is due to the plunger either sticking or failing to drop into groove due to a weak spring

Resetting of the Magneto

and a leaky joint results. In the case of the plugs over the intake valves of some motors, the improper tightening may result in an air leak and consequently the motor may misfire.

In the first place, before replacing any plug, see that all the threads are clean. In the case of the cylinder plugs the next step is to place a little graphite or stove polish on the threads and then start screwing it in place. After it has been tightened with the hand so far as possible apply a wrench, but not harshly. That is, bring up the plug with the wrench as far as possible without straining. Then take a hammer, as shown in Fig. 2, and tap the plug all around lightly and again apply the wrench and it will be found the plug will turn slightly. Then tap with the hammer and again apply the wrench, and keep alternating so, until the plug will turn no more. The gentle tapping loosens the plug and makes turning easier. If this method is practised in replacing the drain plugs of the crankcase, should it be made of aluminum, there is little possibility of the aluminum spreading and cracking. The same method of tapping should be practised when the plug is being removed and it will be found that little effort will be required to turn it with a wrench.

Lever Drops Out of Speed

Quite a number of owners complain that the shifter lever of their cars drops out of one speed into neutral and they cannot account for the peculiar action. Although not all shifter mechanisms are the same, many are constructed as shown in Fig. 1. The rod with the grooves is the shifter rod and extends into the gearset case. A plunger as shown presses against the rod and when the latter is moved into a speed the end of the plunger drops into one of the grooves and thus holds the rod in place. Should the spring become weak the plunger will not drop and hence the rod is free to move backward or forward. If the rod be bent, as is sometimes the case, it will be difficult to shift from one speed to another.

Care of a New Car

The very fact that a car is new does not mean that it requires no attention until the factory guarantee expires, for such is not the case. A little watching may save a lot of harsh words regarding the car and also keep it away from the service station. Many owners complain that their car, "which is only 1 month old," has carbonized cylinders. Very true. In a great number of cases new motors will require valve grinding and carbon scraping in 1 month's time, but

after that scraping and grinding no attention may be needed for 10 months, perhaps. A new car which has been run but 500 miles should be given a renewal of the crankcase oil. This helps the motor materially and will save much trouble later. It takes some time for the parts to work themselves in and the work is not always completed at the factory.

Some owners will take a new car for a 500-mile run and expect the car to require no attention. The spring clips usually are neglected. These clips and the nuts holding them should be watched carefully in a new car and tightened every week for about 10 weeks. The clips stretch slightly when in use and should be taken up. The steering connections should be carefully watched in a new car, for very likely a little excess play may develop. Some owners desire play in the wheel while others object seriously. If all these little things are guarded against while the car is growing into the world much trouble may be averted during its adult life.

Replacing Motor Wires

In cases where the wires of a motor have been removed from the spark plugs it is sometimes a difficult matter to replace the wires in proper order, if the latter are not marked properly. A method which works successfully is as follows:

Take any one wire and hold it against the plug in cylinder No. 1, and at the same time have someone turn the motor over rapidly. If no explosion results, try cylinder No. 2, then No. 3 and then No. 4. The wire belongs to one of the cylinders and when placed against the right plug an explosion will take place. Each wire is taken separately and held against any plug until an explosion is heard. Only three need be tested for a four-cylinder motor; the remaining wire must be for the unwired cylinder.

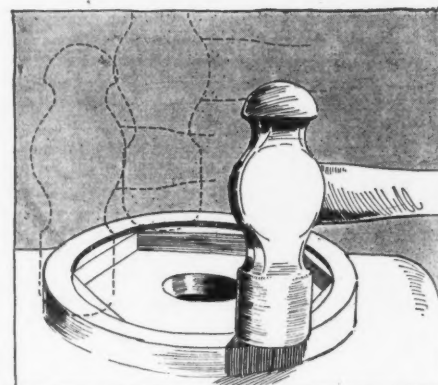


FIG. 2—METHOD OF LOOSENING CYLINDER PLUG

The plug should be tapped all around with a hammer and it will be found that less wrench work will be necessary

Unfiltered Gasoline Means Trouble

Purify Every Drop of Gasoline Before
It Reaches the Carburetor with a
STROMBERG
Gasoline Strainer

Dirt, grit, scalings, filings and water in the gasoline are at the bottom of most so-called carburetor troubles.

The STROMBERG Gasoline Strainer, illustrated below, is designed to remove from your gasoline every foreign substance—dirt, water, everything. The gasoline, when it enters your carburetor, is as clear as crystal. The carburetor, as a result, works always at its highest efficiency.

The STROMBERG Gasoline Strainer may be attached any convenient place in the gasoline line of any automobile, motor boat, aeroplane or gas engine.

If dirty gasoline has been causing you carburetor annoyance, investigate this little device. It will add 100% to your motor-ing enjoyment.

Write for booklet containing prices and full particulars, or call at our nearest branch office, distributor, or Service Station.

Every STROMBERG Gasoline Strainer is backed by the same broad guarantee that backs STROMBERG Carburetors—"The Accepted Standard."



Stromberg Motor
56 E. 25th Street

NEW YORK
DETROIT

BOSTON
INDIANAPOLIS

CHICAGO

Devices Company
Chicago, Illinois

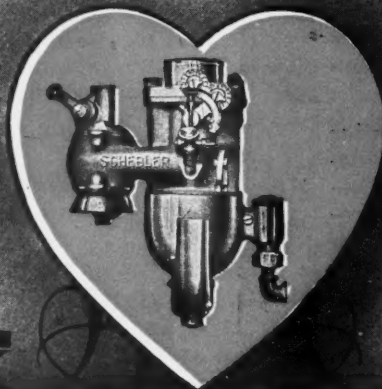
EAST COAST DISTRIBUTORS:
Chicago, Milwaukee, Los Angeles, Portland,
Seattle, San Francisco, San Francisco,
Seattle, Vancouver, Victoria, Russell,
Montreal, Quebec, Montreal, Hamilton,
Windsor, London, Vancouver.

When Writing to Advertisers, Please Mention Motor Age.

Contributor to the Lincoln Highway

SCHIEBLER

*The Aristocrat
of Carburetors*



"The Heart of the Automobile"

WHEELER & SCHIEBLER

"Pioneers in Perfection" of Carburetion

MANUFACTURERS
INDIANAPOLIS U.S.A.

THE SCHIEBLER IS THE ACKNOWLEDGED STANDARD CARBURETOR OF THE WORLD

Branches

NEW YORK
BOSTON
PHILADELPHIA
ATLANTA
MINNEAPOLIS
KANSAS CITY
CHICAGO

DETROIT
DENVER
SAN FRANCISCO
LOS ANGELES
SEATTLE
MONTREAL CAN.
SIDNEY AUSTRALIA

Service Department

Distributors

Every city and town in
the United States and
Canada · Europe and
· Australia ·


 KLAXON

"Electric horn" does not mean Klaxon

PUBLIC demand has forced every car manufacturer to equip with an electric warning signal.

If the signal is not a Klaxon, it is referred to in the maker's advertisements and catalogs as an "electric horn." The name is never mentioned.

In a majority of such cases, the makers are putting on the cheapest signal they can buy, merely to be able to advertise "electric horn" in their equipment.

Most of these are "vibrators"—similar in construction to "buzzers" used in offices and dining-rooms. Their note is neither powerful nor danger-expressing. Often not as much so as the old bulb-horn. The principle on which they operate renders satisfactory service impossible except for a short period when new.

KLAXONS cost from two to eight times as much as "electric horns." All of the best, the well known cars, are Klaxonized. Their makers believe that it pays them to spend this extra money for an accessory recognized as STANDARD. They say "Klaxon"—not "electric horn."

KLAXONIZED CARS

A. E. C.	Metallurgique
Alco	Mors (<i>European</i>)
Armleder	Multiplex
Autocar	National
H. H. Babcock	Nyberg
Benz	Oakland
Borland Electric	Ohio "Six"
Broc Electric	Oldsmobile
Buffalo Electric	Packard
Roadster	Peerless
Century Electric	Peugeot
Charon (<i>European</i>)	Pierce-Arrow
Chicago Electric	Pope-Hartford
Columbia	"Six"
Croxtan	Pratt
Davis	S. & M. "Six"
F. I. A. T.	Schneider (<i>European</i>)
Havers "Six"	S. G. V.
Jeffery	Simplex
King	Stafford
Kissel	Staver
Knickerbocker	Stearns
Knox	Sternberg
Lancia (<i>European</i>)	Stevens-Duryea
Locomobile	Stoddard-Dayton
Lozier	Touraine
Marmon	Walker Electric
Matheson	Ward
Maxwell "Six"	White
Mercedes	Winton



KLAXONET

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

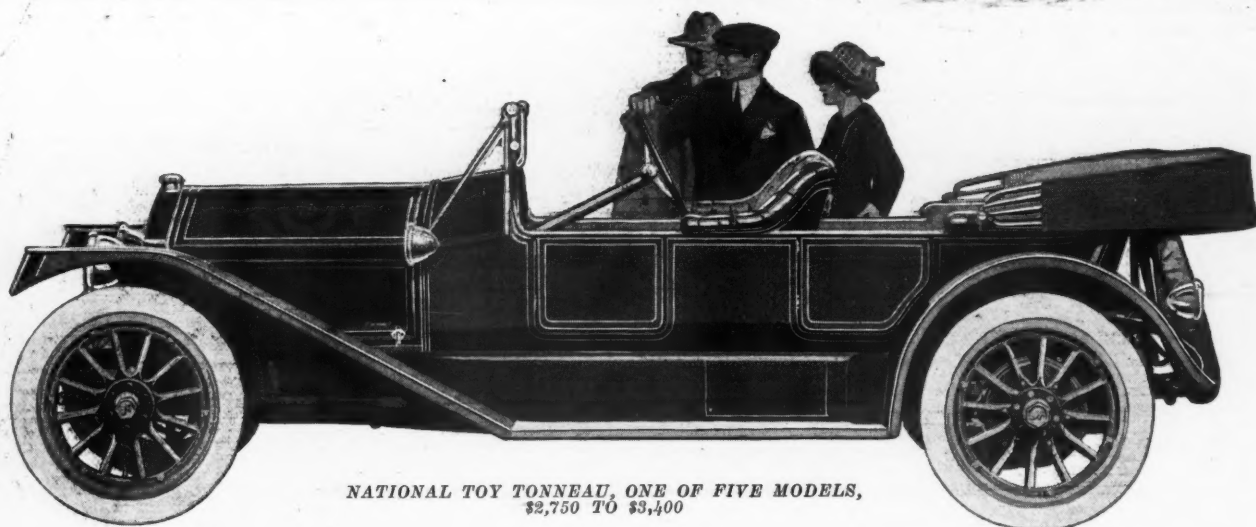
KLAXON

"The Public Safety Signal"



KLAXON

This advertisement planned, written and set up entirely in the Klaxon Factory. Type composition by the Klaxon Press with "Klaxon" type especially designed by Goudy.



NATIONAL TOY TONNEAU, ONE OF FIVE MODELS,
\$2,750 TO \$3,400

National

Built and Guaranteed
By The

National Motor Vehicle
Company, Indianapolis, Ind.

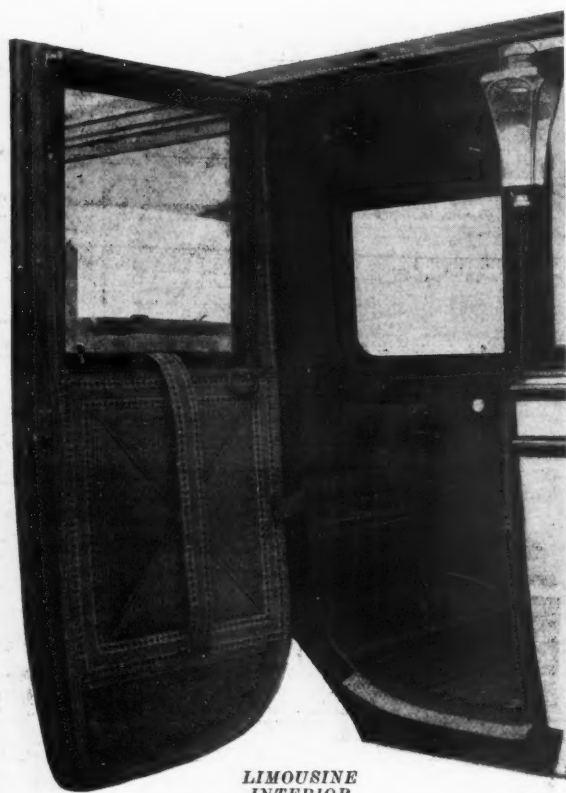
STEADY

TODAY this word Steady has a vital meaning to you as applied to motor cars.

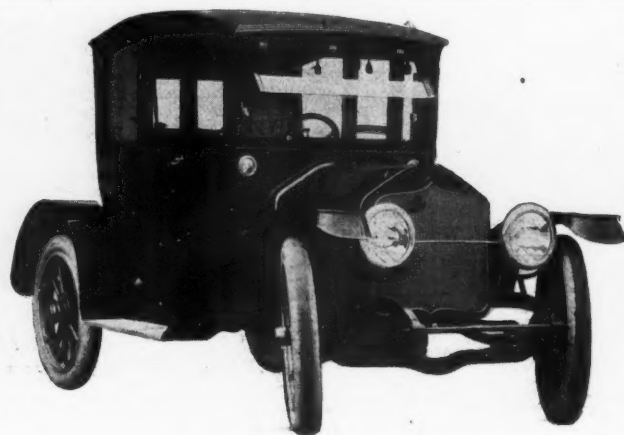
AND no other car enjoys more, all that Steady implies, than does the NATIONAL car.

- steady growth for fourteen years,
- steadily increasing in output,
- steadily maintaining leadership in quality,
- steadily advanced in design,
- steadily winner of all important contests,
- steadily performing day after day for owners.

BACKED by a Steady company that is reliable and here to stay.



LIMOUSINE
INTERIOR



COUPE



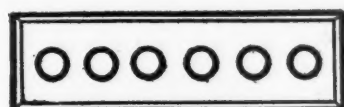
NOW COMES

The Automatic Electric Gear Shifter



WE HAVE HAD

"Push the button and start your engine"



NOW WE HAVE

"Push the button and secure any speed"

all accomplished by the magic fluid, Electricity, stored in the



Storage Battery

by an Electric Lighting Generator

Write us for full information

WILLARD STORAGE BATTERY CO., Cleveland, Ohio

New York Branch: 136 W. 52nd St.

Detroit Branch: 1191 Woodward Ave.

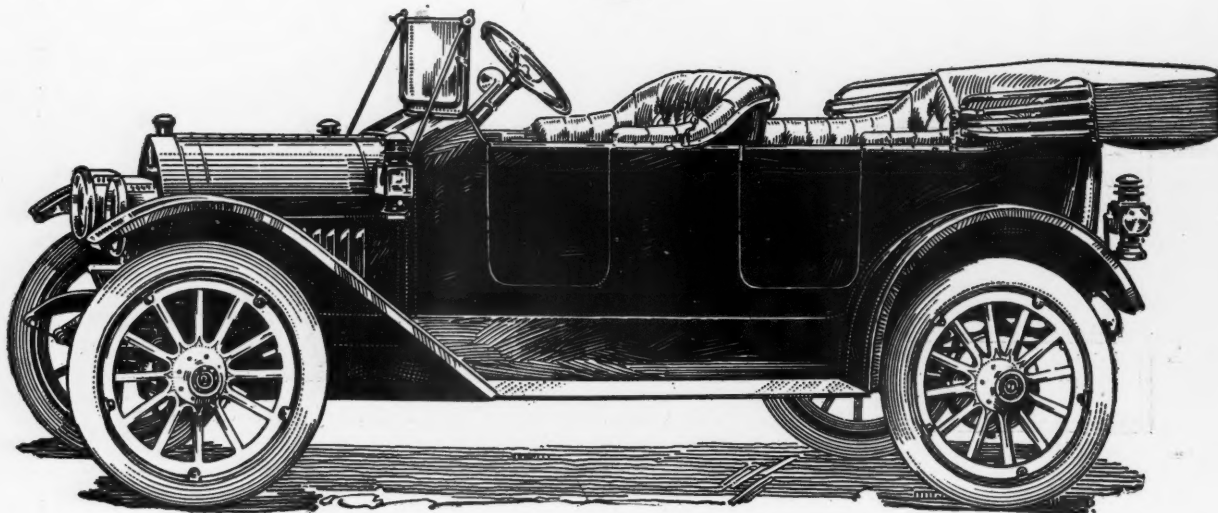
Chicago Branch: 2241 Michigan Ave.

San Francisco Branch: 243 Monadnock Bldg.

Indianapolis Branch: 438 and 439 Indiana Pythian Bldg.

Depots in all Principal Cities in the United States and Canada

66



EMPIRE

"The Little Aristocrat"

Completely Equipped

Now \$900

New Series Model 31 Empire, for the Season of 1914

A larger, more beautiful car with every luxury and equipment

Basic principles of design and construction unchanged; severest tests and hundreds of thousands of miles proved them right. *But a score of refinements and improvements* are incorporated in the new series Model "31" EMPIRE for 1914 that make it still a better car than last season's EMPIRE, and it sells for less.

Quadruple output and quantity buying enables us to add to the beauty, size and value of the car and yet to reduce the price by fifty dollars—the biggest value yet offered to dealers and automobile buyers.

Dealers, there remains some open territory. Our broad, liberal sales plan offers a rare opportunity for a permanent connection. Tomorrow may be too late to secure territory.

Completely Equipped \$900 Including

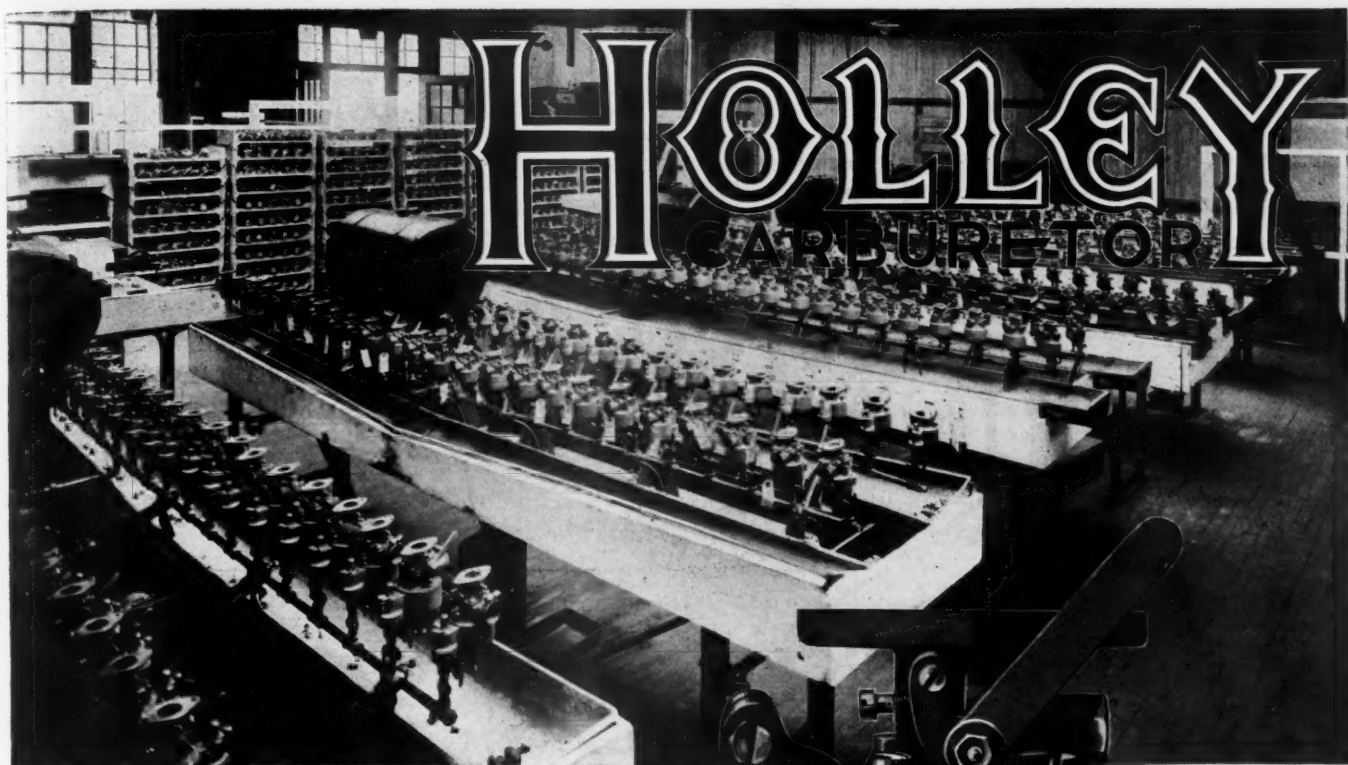
Demountable Rims	Unit Power Plant	Stewart Speedometer	Eisemann Magneto
Mohair Top	Rain Vision Windshield	Prest-O-Lite Tank	Double Tire Irons
Top Envelope	Tool and Tire Kits	Gas Head Lights	Oil Sight Feed
110" Wheel Base	Extra Rim	Oil Side and Tail Lamps	Dash Air Adjustment

Write for Our Advance Catalogue for 1914 and for a Copy of Our Illustrated Transcontinental Empire Tour Book

Empire Automobile Company

448 N. Capitol Avenue, Indianapolis, U. S. A.





HOLLEY self-adjusting carburetors are here shown undergoing a rigid test just before being packed for shipment.

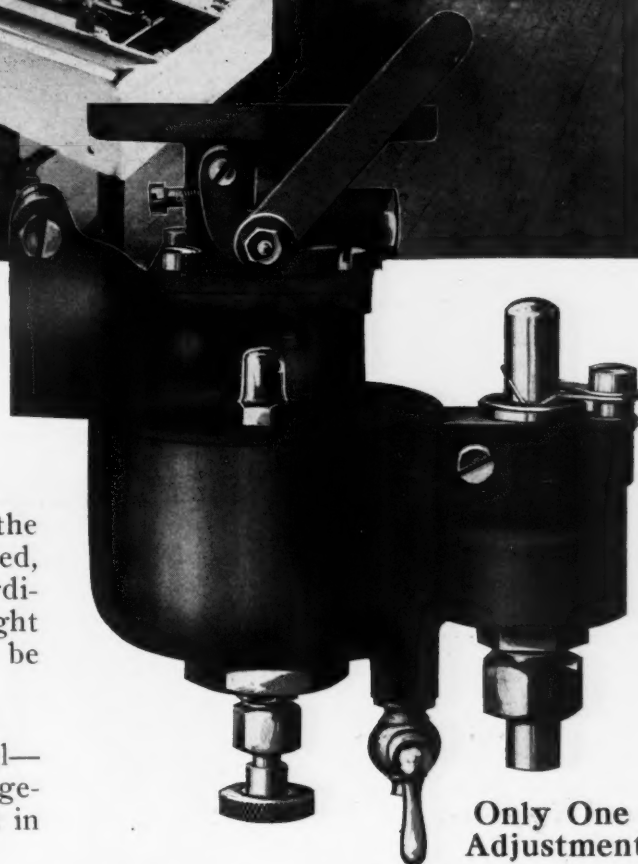
¶ On account of the non-adjustable features, the Holley no-moving-parts carburetor must be designed, made, and tested with greater accuracy than the ordinary types of adjustable carburetors in which slight inaccuracies of gasoline and air openings may be corrected by mechanical adjustment afterwards.

¶ The castings must be perfect, the gasoline level—right, the openings exact, the compensating arrangement perfectly automatic, not only in theory but in action.

¶ The self-adjusting Holley fulfills all these conditions—it is entirely capable of accommodating itself to varying air pressures and temperatures.

¶ Especially efficient in cold weather—makes starting easy.

¶ Have your car equipped before the cold weather comes.



Only One Adjustment

REO ACCESSORIES COMPANY
1220 Michigan Avenue.....Chicago, Ill.
OMAHA RUBBER CO......Omaha, Neb.

FOREIGN BRANCH:
HOLLEY BROS. CO......Coventry, England

Holley Carburetors are carried in stock at the following addresses: **CHAS. E. MILLER**, Home Office: 97-103 Reade St. and 121 Chambers St., New York.

BRANCHES:
New York City.....924 Eighth Ave.
Between 54th and 55th Sts.
New York City.....2782 Broadway
Between 107th and 108th Sts.
Springfield, Mass.....Bridge and Dwight Sts.
Hartford, Conn.....274 Trumbull St.
Atlanta, Ga.....66 Edgewood Ave.
Brooklyn, N. Y.....1421 Bedford Ave.
Buffalo, N. Y.....824 Main St.
Albany, N. Y.....135 Central Ave.
Boston, Mass.....202-204 Columbus Ave.
Detroit, Mich.....227-229 Jefferson Ave.
Cleveland, O.....1829 Euclid Ave.
Philadelphia, Pa.....318 No. Broad St.
New Orleans, La.....601-603 Baronne St.
Newark, N. J.....274 Halsey St.

Holley Brothers Company

131-141 Rowena Street

Detroit, Michigan

When Writing to Advertisers, Please Mention Motor Age.

PENNSYLVANIA *Oilproof* VACUUM CUP TIRES

Their Success to Date

Their Future Programme

*Did You
Ever See
Tires
Make
So Good?*



When Writing to Advertisers, Please Mention Motor Age.

While the position of Vacuum Cup Ties has been an enviable and prominent one from the start, it is in this fourth season, now closing, that their success has expanded and rounded out so as to command the general attention and recognition of the whole body politic of the automobile world.

The utmost capacity of the present factory having been overtaken early this year, an additional large factory building was erected in which mechanical equipment is now being installed. Still another building, larger than the old factory and the new addition combined, was soon after projected as a result of the strong growth of demand. This greater building is now nearing completion.

With the more than doubled production that will result from the operation of the new factories this winter, together with the assurance of the same quality being maintained, which has brought Vacuum Cup Tires so markedly to the front, their success will be greatly amplified, to say the least, beginning with the opening of next season.

IMPORTANT NOTIFICATION

Due to the consistently remarkable service records during the big season just closing, emphasized by almost total absence of adjustment claims, the printed guarantee attached to each Vacuum Cup Tire has been raised 800 miles to

4,500 MILES

RETROACTIVE ON ALL TIRES SOLD SINCE MAY 1, 1913

Pennsylvania Rubber Co., Jeannette, Pa.

Pittsburgh, 505 Liberty Avenue
Cleveland, 1921 Euclid Avenue
Detroit, 254 Jefferson Avenue
Chicago, 1004 Michigan Avenue

Minneapolis, 34 S. 8th Street
Kansas City, Mo., 514 E. 15th Street
Omaha, 215 S. 20th Street
Seattle, Armour Building

New York City, 1889 Broadway

PENNSYLVANIA RUBBER COMPANY OF NEW YORK
Boston, 149 Berkeley Street

Dallas, 2111 Commerce Street

San Francisco, 512-514 Mission Street

PENNSYLVANIA RUBBER COMPANY OF CALIFORNIA

Los Angeles, 930 S. Main Street

An Independent Company with an independent selling policy



When Writing to Advertisers, Please Mention Motor Age.

Federal Quality and Service

Its relation to the growth
of a big industry

An impressive story of a remarkable industrial achievement is told by the illustrative features of this advertisement.

In the short space of two years the plant of the Federal Rubber Manufacturing Co. at Milwaukee has grown from the small group of buildings originally purchased to the magnificent property of today.

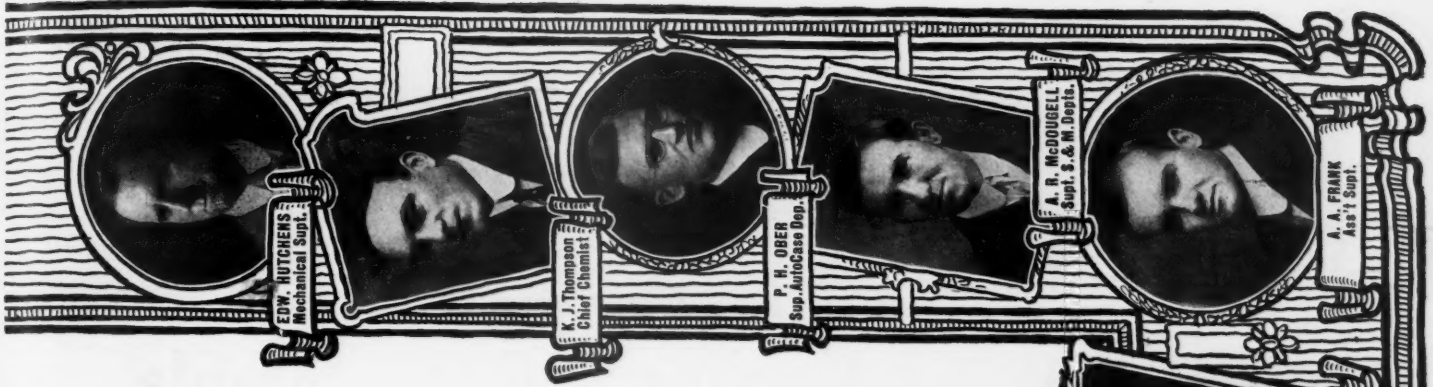
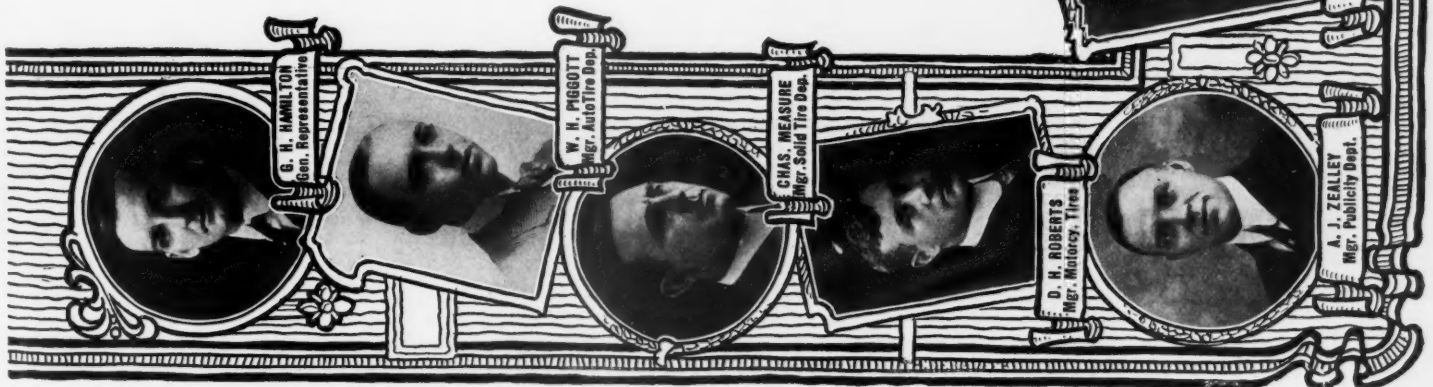
Its floor space has been increased five hundred percent and its annual production now reaches many millions of dollars.

The "Extra Service" quality incorporated in Federal Tires and other products, and the excellent service rendered through the many branches and service stations of the company have been important factors in building up this imposing institution.

That the trade and consumers generally appreciate the broad and thorough *Federal Policy* of Quality and Service, is evidenced by the rapid growth of the business of the company.

Federal Rubber Manufacturing Co. Milwaukee

Branches and Service Stations in all principal cities



MOTOPHONE

A Mechanically Operated Horn

Efficient

Economical

Simple

NO Battery Expenses
Motor Troubles

NO Electrical Wiring
Adjustments



A mechanical horn superior to any motor driven horn or any other warning device.

\$12.00

A loud, steady blast is emitted by a slight touch of the lever—as compelling as any motor driven horn. Conceived—perfected—manufactured and guaranteed by the largest auto horn manufacturer in the world.

America's Pioneer in the Auto-Horn Industry

Automobile Supply Manufacturing Company

220 Taaffe Place

INCORPORATED 1904

BROOKLYN, N. Y.

When Writing to Advertisers, Please Mention Motor Age.

MOTOPHONE

A Mechanically Operated Horn

¶ Our aim in producing the Motophone horn has been to offer to the trade a warning signal to be of perpetual use to the owner.

¶ This new product is the acme of mechanical skill, which has been accomplished by nine years of manufacturing experience in warning signals.

¶ The "MOTOPHONE" horn operates mechanically. A loud, steady blast is emitted by a slight touch of the lever, eliminating the constant care of the electric motor, the re-charging of storage batteries, adjustments and cost of maintenance. It means a great relief to the motorist whose experience in the use of the warning devices now on the market has been a continuous source of trouble.

¶ We were quite alive to the fact that the public required an efficient device that would, at all times, under all conditions, give instantaneous alarm, with no liability of failure.

¶ The ingenious mechanism embodied in the "MOTOPHONE" horn is original, and our aim has been to develop a signal to stand far above any other of its class, and that it should meet the approval of the trade in general for its merits alone.

A very severe test was made to determine its durability and the result was that over 5,000,000 signals were obtained, after which no adjustments were required or loose parts noticed.

¶ Orders for large and small quantities will receive prompt attention. Deliveries start Oct. 15.

Automobile Supply Manufacturing Company

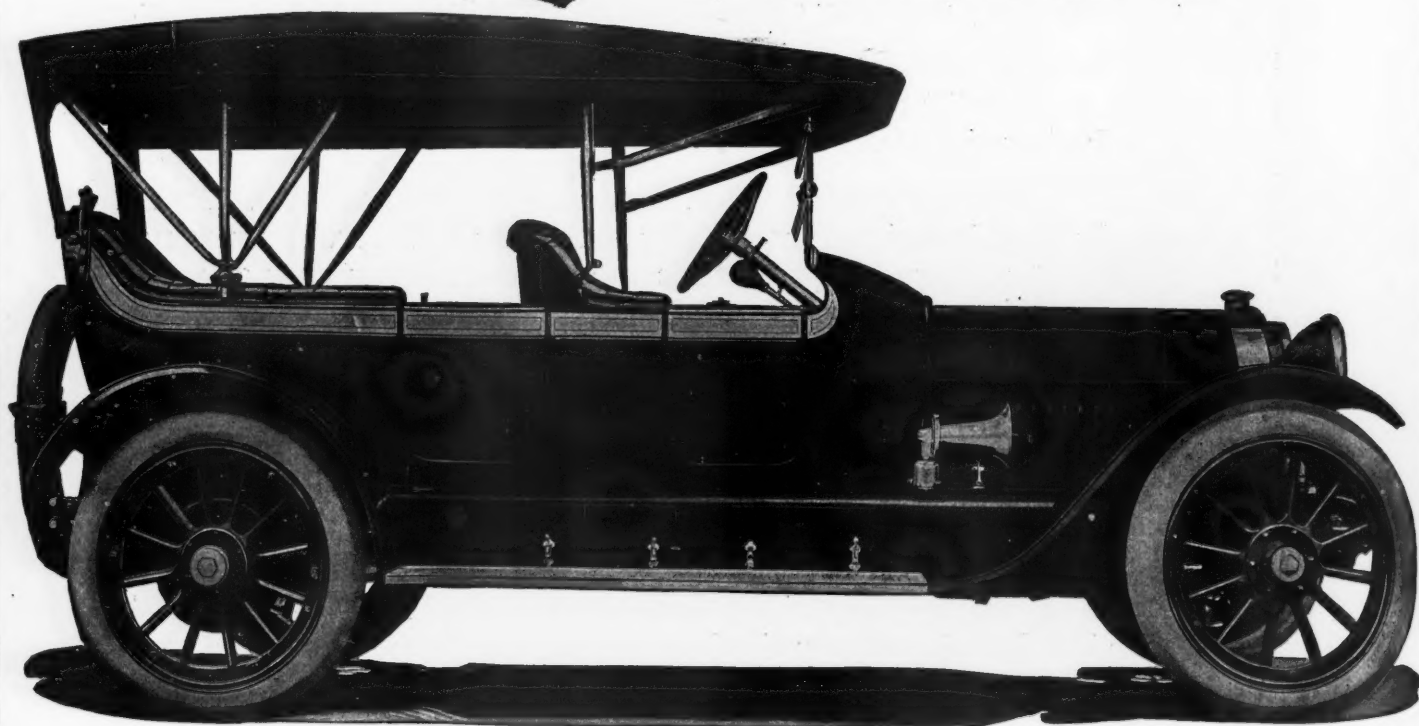
220 Taaffe Place

INCORPORATED 1904

BROOKLYN, N. Y.

The *Pilot*

"The Car Ahead"



PILOT 60

**Six cylinder, four and six passenger
67 Horse Power, 132-inch wheel base**

The most beautiful car ever offered

Price, \$2785

WE call the attention of all owners of automobiles to the beautiful car above illustrated. Note the symmetrical lines, the harmony in proportions and the classy character which distinguishes this handsome car from all others.

Built to Wear—Not Just to Sell

For four years the word Pilot has been a synonym for honesty in material and construction, and no car built in this country has such a consistent record for unqualified service as this great Richmond, Indiana, car. Every important essential is built by makers with a national reputation for the reliability of their product and put together by skilled workmen for which the city of Richmond is famous. Pilots have earned their reputation for reliability under the most strenuous conditions of travel, and from every standpoint, construction, material, refinements and luxuries they can be compared only with the highest class cars made in this country and selling for a thousand dollars more in price. Pilots have always been noted for their beauty and general attractiveness, but they look much better inside to the man who knows even than they do on the outside, and we gladly submit the following specifications of our 1914 Pilot 60 for comparison with all other cars made selling at the very highest prices.

The **Teeter motor**, six cylinder, 4-inch bore, 6-inch stroke, the most wonderful gas engine ever placed in an automobile and with a record for hill-climbing ability and general road work that has never been approached. Built of such high-class material and put together by such skilled workmen the replacement cost on this motor to the Pilot Motor Car Co. has been so low as to be almost unbelievable, the entire cost of replacements and repairs of every nature and kind whatsoever being less than 25 cents per motor. This remarkable gas engine has been a revelation to every owner, particularly if they have had other cars, and they will be found in all Pilot models for 1914.

The **frame** is 7/32 inch steel, reinforced ends and of extraordinary strength for a car the weight of the Pilot 60.

The **transmission** is made by the Warner Gear Co. of Muncie, Ind., and its reliability has been proven under every condition of public travel.

The **cone clutch** of extraordinary efficiency and perfect construction insures Pilot owners almost an immunity from clutch trouble.

The **propeller shafts** and **universal joints** are of extra large size, and we have yet to make a replacement of either of these parts. They are the highest class product of the Hartford Auto Parts Co.

The **axles** are especially made for Pilots by the Hess Spring & Axle Co. of Cincinnati, Ohio, recognized manufacturers of the finest axles in this country.

The **shafts** are chrome nickel steel, 1½ inches in diameter, with electrically welded flanges, and the differential gears are the product of the Brown-Lipe Co. of Rochester, N. Y., whose differential gears have a world-wide reputation.

Hoffman balls in N. D. **bearings** are used in the front hubs and the famous F. & S. twelve ball bearings in the rear hubs. This wheel bearing combination could not be excelled, and considering the load carried have an extraordinary large margin of strength, safety and shock-resisting quality.

The beautiful jewel **bodies** are our own design and made especially for Pilots by the Portland Body Works of Portland, Ind., builders of the finest automobile bodies in this country.

The famous Mayo **radiator** made by the Rome-Turney Co. of Rome, N. Y., insures cooling efficiency to all Pilot owners.

The **springs** made by the National Spring Co. of New Castle, Ind., of the highest quality of Sheffield spring steel, aid in giving Pilots the easy-riding qualities which they are noted for.

The **wheels** with second growth hickory spokes of large size and Stanweld rims complete the chassis, the equal of which is hard to find regardless of price.

The Gray & Davis system of **lighting** and **starting**, Carter carburetors and Goodyear tires show the standard character of every part used to insure general high-class service to owners.

The **chassis** in the Pilot 60, six cylinder, is an exact duplicate of the one which recently made the trip from Indianapolis to Los Angeles in the Indiana Manufacturers' Tour with a perfect score, **four thousand miles without a mechanical road adjustment.**

With this kind of a record for reliability behind the Pilot and with its beautiful body design, luxuries and refinements, we invite all agents and car owners who are in the market this year for a car to write us for our beautiful art book and illustrated circulars showing all Pilot models in detail. We have a wonderful agency proposition for all unoccupied territory and co-operate with our agents from every standpoint.

The wonderful Westinghouse Air Springs special equipment on Pilot models.

Other Models

Pilot 50, Roadster and touring car, 120 inch wheel base, \$2250; six and seven passenger bodies with 126 inch wheel base, \$2500.

PILOT CAR SALES CO., Richmond, Ind.

The Springs of Utmost Strength



Cleveland-Canton Automobile Springs

Cleveland-Canton Chrome-Vanadium Steel Springs have established a record for strength and wearing qualities unparalleled in automobile history.

In five years since we adopted Chrome-Vanadium Steel NOT ONE was returned because of breakage or settling.

These powerful springs combine strength

and flexibility in a truly remarkable degree. They stand terrific strains yet protect the delicate parts of an engine by absorbing road-shocks and jars that would otherwise rack it to pieces.

Cross-Rolled Chrome-Vanadium

"Not a Bump in One of Them"



"Built for Life-Long Endurance"

Chrome-Vanadium Steel is made by what is known as the "cross-rolled" method. It is treated both longitudinally and transversely. That method is scientific and utterly eliminates all *chance of flaws*. By no other method can such absolute freedom from these flaws and consequent weaknesses be insured.

This cross-rolled steel is then tempered by our own special process. It is heat treated in oil—not merely flashed in it, or water chilled. And the springs are fitted by hand.

The result? Springs of utmost strength and uniformity—springs that are full of life, yet can be relied upon in times of emergency when all that extra strength is vital.

Cut Cost of Upkeep

You simply *can't afford* to be SATISFIED with ordinary spring service when a better spring service is at hand! Find out more about Cleveland-Canton Automobile Springs NOW. Learn how they cut up-keep costs. Write us today for proof of their ability to do it!

Best Grade—"Chrome-Vanadium"
Next Best—"Special Analysis"

The Cleveland-Canton Spring Co.
Canton, Ohio, U. S. A.





5 Passenger Coupe, \$2900

The Borland Electric

GAS CAR DEALERS: Make two car sales where you made one before. Cash in on the time on your hands during the dull months when gas car sales are slowest. Supplement your line of gas cars with the BORLAND Electric.

BORLAND Electrics are in demand the year 'round. Our nationwide advertising campaign—directed at over 4,000,000 readers every month—is making scores of prospects for you right in your own town. We will co-operate with you—help you clinch sales. Our dealers' proposition is unusually liberal.

Get in on this now, while your territory is still open. Take no chances on the dealer across the street grasping this opportunity first. Write or wire us.

Full descriptive literature on request

The Borland-Grannis Company 310 E. Huron St.
Chicago, Illinois



When Writing to Advertisers, Please Mention Motor Age.

INVADER OILS

To tell the truth—

INVADER OIL **will** leave a carbon deposit. So will every other oil.

INVADER OIL **will** smoke when it burns. So will every other oil.

When INVADER OIL is used it **may be** necessary to grind valves. Such certainly would be the case with every other oil.

A motor using INVADER OIL **can** overheat. So it can when any other oil is used.

A machine exclusively lubricated with INVADER OIL **will** eventually wear out. This would also be the case no matter what oil was used.

INVADER OIL is **not** a perfect lubricant—neither is any other oil. There is no such thing.

INVADER OIL, however, is chemically superior to all other oils. It will deposit **less** carbon—make **less** smoke, mean **less** grinding of valves—make a motor **less liable** to overheat, and will cause the machine using it to last **longer** mechanically than would be the case were **any** other oil used.

Remember that the superiority which is indicated by its better tests is a superiority which cannot be contradicted. INVADER OIL is better because its tests are better. There is no way of avoiding this fact.

FACTORIES:

NEW YORK.....92 Pearl St.
PHILADELPHIA.....113 Arch St.

BRANCHES:

BOSTON.....284 Columbus Ave.
WASHINGTON...512 Kenos Bldg., 11th & G Sts., N.W.
PHILADELPHIA.....113 Arch St.

I N V A D E R
Lessees of Chas.
Main Office: 79 BROAD

i-o-c GEAR OIL

Puts noisy gears to sleep

I-O-C GEAR OIL is the only oil ever made especially and exclusively for the lubrication of automobile transmission gears.

It is absolutely different from any other oil made and possesses certain peculiar properties that cause it to face the gear teeth with a coating that is practically indestructible and prevents wear and reduces noise and friction to a minimum.

It contains no foreign matter such as ground cork, sawdust, etc., but is 100 per cent. OIL, and being free from water and chemicals, it will not foam in the case when running or allow the bearings to rust when idle.

Remember, it is only the OIL which a grease contains that has any lubricating value. I-O-C GEAR OIL is not only all oil, but it's the only oil that will eliminate the hum or grind of metal gears.

A 10 LB. CAN COSTS \$1.50

A trial will convince the most skeptical that I-O-C Gear Oil is better than any grease, any dope, any compound, or any other form of gear lubricant ever put on the market.

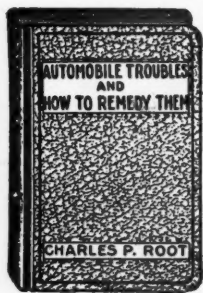
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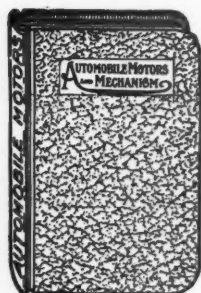
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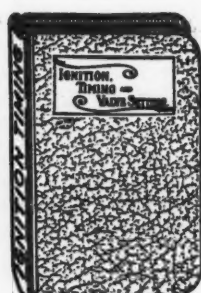
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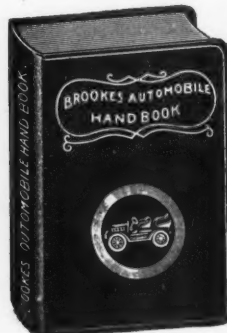
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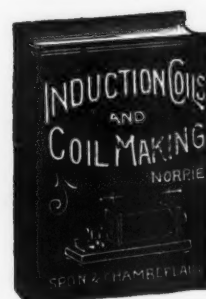
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Price \$400 to \$700 Less Than Any Other Truck of Equal Specifications

The Service is a sturdy, Standardized Truck (built strong to give Efficient Service) in which every unit is built larger than in any similarly classified truck, to stand the racking vibration and shock of hard service.

Every Unit is Standardized

Timken Axles, Timken Jack Shaft, Timken Transmission in 3 Ton, Warner Transmission with Timken Bearings in 1½ Ton and 2 Ton, Timken Bearings throughout, Buda Motor, Stromberg Carburetor, Eisemann Magneto, Longer Wheel Base—Larger Frame—Heavier Springs—Overside Tires—Underrated Carrying Capacity, Etc.

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Every unit incorporated in the Service Truck is the best production of of the ablest engineers in the world. Only the best is good enough for Service Trucks—Standardized Units and Larger Units which result in More Efficient Service at less cost. That's why the Service is the safest and best truck to buy.

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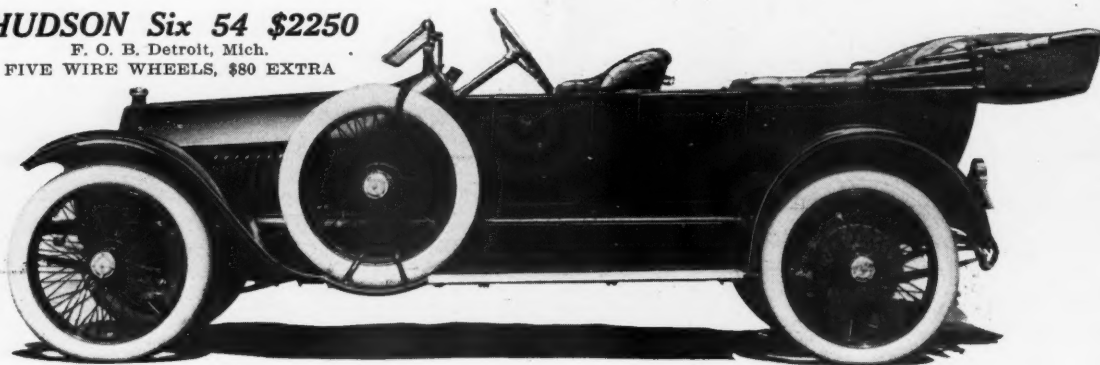
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HUDSON Six 54 \$2250F. O. B. Detroit, Mich.
FIVE WIRE WHEELS, \$80 EXTRA

Experience Six Cylinder Smoothness in Your Four

—But This Is The Only Way You Can Get It

SPEED your Four up to 30 miles an hour or more on a smooth road. Then throw out the clutch and close the throttle.

Or coast down a long, smooth hill with the motor running idle.

The feeling is that of flying. There is no vibration. In this particular the sensation of riding in a Four approaches that felt in a Six.

But, in a Six, the smoothness is ALWAYS there. You ride like constant coasting. In the HUDSON Six 54, up hill and down, on rough roads or smooth, fast or slow, the feeling is always the same.

No Four—no matter how powerful or through what combination of gears its power is transmitted—can be made to ride so smoothly.

Come, take a drive in the HUDSON Six 54.

If you enjoy driving, take hold of the wheel and feel for yourself the full meaning of that much-talked-about "smoothness and flexibility of the Six."

In no other will it have such a meaning for you.

Try coasting with your Four on a run of 100 feet.

Then come, see us, we'll show you how to do it for 300 miles, all day, without fatigue. It must be in a HUDSON Six 54.

New Features in HUDSON Six 54

True streamline body—the handsomest car you ever saw. Highest standard of HUDSON design and construction. The very best we know in beauty and finish. Left side drive. Right hand control. Entrance to driver's seat from either side. Electrically self-cranked and electric lighted.

Accept Howard E. Coffin's 1914 Automobile Review—We'll Send It!

No automobile buyer should fail to read Mr. Coffin's Automobile Review.

He shows why six cylinder cars are now so popular.

He explains the reasons for their smoothness, and why they are so desirable. With diagrams, and in the clearest language, he makes you understand why so many makers are now manufacturing sixes exclusively.

He tells about left side drive and right side drive—about gasoline economy—electric and other gear shifts—streamline bodies—speedometer drive—new things in lighting, and other features embodied in the 1914 designs.

No man is more eminently qualified to prepare such a review. Mr. Coffin's reputation as an engineer, and his many contributions to the progress of the automobile industry both

as a designer of many successful cars, and a contributor to engineering literature, make his review authentic.

Of course he refers to the HUDSON Six 54. No discussion of automobile tendencies would be complete that omitted mention of this new car.

Can you afford to consider the purchase of any car costing \$1,500 and over without knowing what such an authority as Mr. Coffin has to say upon the subject?

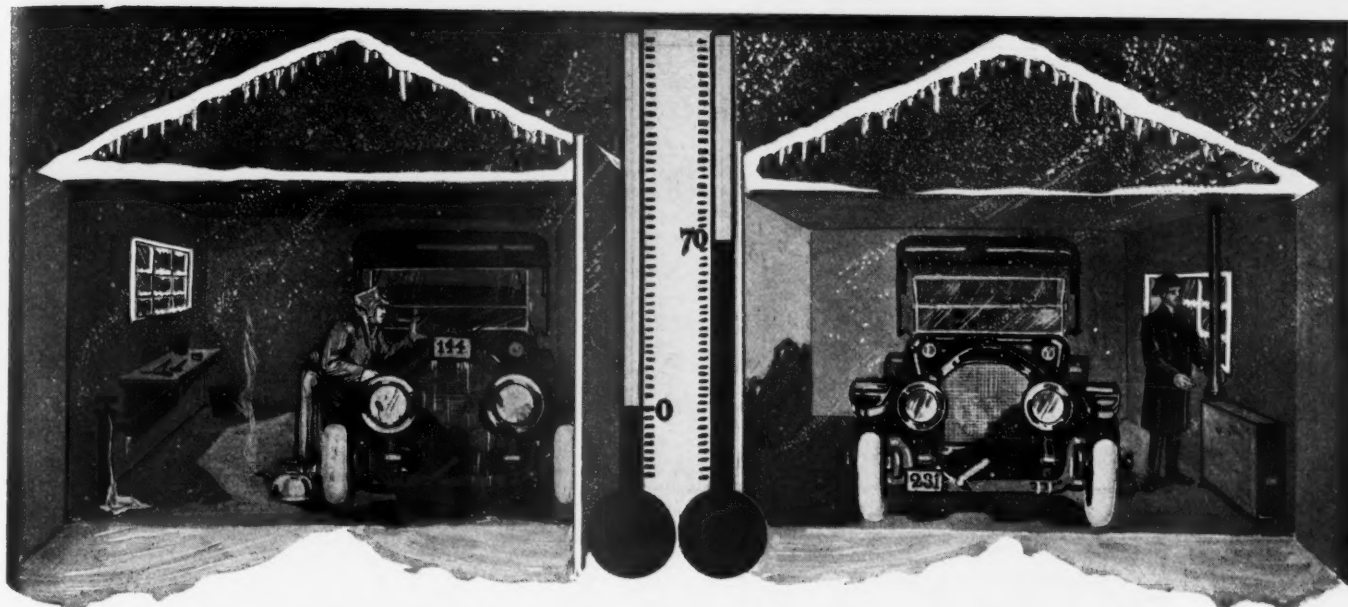
Send your name and address.

HUDSON Motor Car Company

7739 Jefferson Avenue

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START YOUR CAR ON A WINTER DAY AS EASY AS THE SUMMER WAY

With a Scientific Safety Garage Heater

No more Starting Troubles, no more Poor Oil Flow—simply give the crank a quarter turn or press starter button and away you go, without danger of having Frozen the Radiator or Cracked a Water Jacket.

Whether you own a Pleasure Car, Motor Truck or Electric, we make it possible to drive your car **twelve** months a year, instead of eight, with the same efficiency and comfort as you derive in summer time, besides creating an atmosphere in your garage as warm and dry as your parlor. You may do the necessary tinkering on your car, or make that tire change, with sleeves rolled up and not endanger your health. Depreciation from rusted parts or damaged paint cannot occur. Electrics take full charge.

The Scientific Safety Garage Heater

It is not a stove and is **absolutely** guaranteed by insurance men as being positively safe. Built on the miner's lamp principle—gasoline fumes cannot ignite.

READ WHAT TWO USERS SAY:

"Yours of July 5th received inquiring in regard to the success of your safety Garage Heater which I put in my garage last winter, and I am very glad indeed to say to you that it is a perfect success. My garage is 25 feet square, built of hollow tile and cement and faces the east. I have no trouble whatever in heating the garage from 60 to 65 degrees in zero weather. It heats up very quickly, and when the garage gets warm I shut off the gas and do not start it up again until it begins to get cold. It is one of the finest heating appliances for a garage that I have ever seen, and everybody I have shown it to says the same thing. I cannot see where there is the least particle of danger, and it takes up very little room and is always ready."

"Answering your esteemed favor of the 25th, received during my absence from the city, would say that I am very much pleased with your Safety Garage Heater. I expected when you installed the two it would be necessary for me to have both of them in continuous operation during the cold weather. To my surprise, I found this to be the contrary, and that the one on the wash rack was sufficient to heat the barn and keep it at summer temperature." By this installation of your Heaters I have been able to operate one of my highest powered cars during the coldest days in the winter months, starting the motors without any effort whatever. Your heater is safe, reliable, and effective, and is competent of doing a great deal more than you claim for it."

COSTS ONLY A FEW CENTS A DAY

Consumes either natural or artificial gas at a meager daily cost; simple and inexpensive to install, and needs no attention when once started. Only one match is needed to run the heater all winter long. Occupies what would otherwise be waste room. It heats an ordinary two machine garage from freezing to 70 degrees in a very short time.

The price of the heater is \$25.00, delivered east of the Rocky Mountains. All orders made before Dec. 1st, 1913, will be shipped on a fifteen day Free Trial, freight charges prepaid.

Order at once before cold weather sets in. If you want more information write today for our valuable booklet, "Protecting Your Car In Winter"—it concerns YOU.

The Scientific Heater Company

The Largest Builders of Gas Heating Apparatus in the World
1400 Power Avenue, Cleveland, Ohio

Send me your booklet, "Protecting Your Car In Winter," and all other information regarding your Scientific Safety Garage Heater. Approximate size of my garage.....
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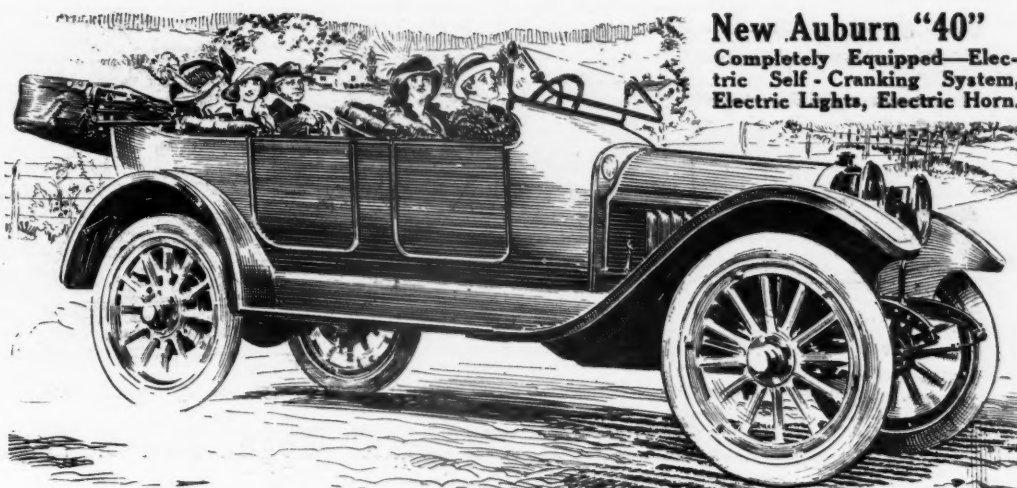
Again in 1914
Pierce-Arrow
Cars
will be regularly equipped with
CONNECTICUT
SHOCK ABSORBERS

Installing Stations in 300 Cities

The Best Proposition for the Manufacturer, Dealer, Owner

CONNECTICUT SHOCK ABSORBER CO.
MERIDEN, CONN.

When Writing to Advertisers, Please Mention Motor Age.



New Auburn "40"
 Completely Equipped—Elec-
 tric Self - Cranking System,
 Electric Lights, Electric Horn.

\$1490!

Do not take on any car until you have judged
 the astonishing sales possibilities of the New
 Auburn "40." Write today for new folder.

THIS is 1914's startling value—a large, beautiful, 120-inch wheelbase car, equipped with every luxury and convenience of high priced cars. At \$1,490! Its graceful body design is that adopted for 1914 by two famous European cars. It is the year's value sensation. Each year some maker brings out the "season's best buy"—a car that makes its dealers rich.

This year that car is the New Auburn "40."

Note, when you ride in it, its stamina. There is no hill, no sand, that can feaze its wonderful motor. Note, too, these advanced features:

Left Drive
 Center Control
 Electrically Self-Cranked
 Electric Lighted
 Electric Horn
 Rain-Vision Ventilating Windshield
 36x4 Tires; Demountable Rims

Full Floating Rear Axle
 Cowl Dash
 Turkish Type Upholstery—Finest of Leathers
 Wide Doors (With Concealed Hinges) as on 1914
 European Cars
 Dustproof En Bloc T-Head Motor
 Extra Roomy Tonneau—29 Inches Foot Room
 Tire Irons, With Extra Demountable Rim

And now about the manufacturer's permanence. One of Dun and Bradstreet's highest ratings—one of the very highest in the motor car industry—is given the Auburn Automobile Company. Kindly look us up.

This car is now on exhibit at showrooms at nearest Auburn dealer—write for his address, our dealers' proposition and the new, complete, descriptive folder to

Auburn Automobile Company
Auburn, Indiana

THE ATTERBURY LINE

Makes Bigger Business--- More Business

YES, BIGGER BUSINESS FOR THE OWNER because it offers efficient delivery service at a surprisingly low cost. It enables him to widen his range of delivery—serve *more* people and with greater regularity. The ATTERBURY is built so well by men who are traction experts—that it is a stranger to the repair shop.

MORE BUSINESS FOR THE DEALER who handles ATTERBURY TRUCKS is an assured fact.

In the first place he has a complete line—to meet the needs of almost every business. The line comprises 1,500-lb. delivery wagons, 1, 1½, 2, 3, 4 and 5-ton trucks, hotel buses, sight-seeing and pay-as-you-enter cars.

In every ATTERBURY feature there is a logical, convincing selling argument. Powerful torsion rods receive all the thrust and relieve the rear axle of unnecessary burdens. The rear system is the best ever built. The shock of starting, stopping and operating is taken up by heavy buffer springs on the radius rods. ATTERBURY TRUCKS have plenty of power, automatic governor, selective transmission and many other features which actually *sell the Truck*.

We have some desirable territory open for live dealers, and an attractive proposition. Write us.

ATTERBURY MOTOR CAR COMPANY

Black Rock, Dept. "M"

Buffalo, New York



Model D—3 Ton

1914 Announcement

1903-1914

Eleven Years of Success

Pullman

The Pullman Company is big enough to take proper care of the dealers' orders, and to give the best service to customers; but is not big enough, nor does it care to, domineer. We consider every dealer a member of the Pullman family and consult him before making changes in policy or mechanical construction.

We are veterans in the automobile manufacturing business and are building in our own plant more of the automobile than nine-tenths of the other manufacturers.

PULLMAN CARS are fully abreast of the times and are equipped with the most reliable and up-to-date parts and accessories, such as Westinghouse Electric Starting and Lighting System, Bosch Magnetos, Timken Axles, Spicer Joints, etc.

On the new "LITTLE SIX" we use the **Vulcan Electric Gear Shift** and wire wheels as regular equipment, and on other models as optional equipment.

A PULLMAN DEALER'S sales are limited only by his own ability, because from the Medium-Sized Four at \$1575 to the Large Six at \$2850 he has a wide range of buyers. And he has talking points such as only the highest grade of cars have.

Read carefully the following specifications of our new model "6-46."

SPECIFICATIONS:

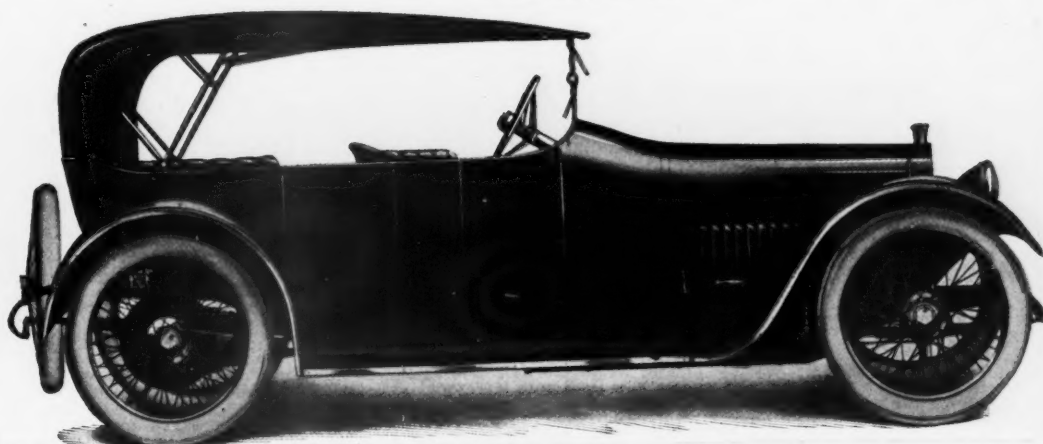
MOTOR—3½ x 5½. TRANSMISSION—Four speeds. GEAR SHIFT—Vulcan electric. STARTING AND LIGHTING—Westinghouse system. AXLES—Timken. GASOLINE TANK—Carried in the cowl. DRIVE—Left hand. EMERGENCY BRAKE—Out of the way, leaving free space for getting in and out of front seats. BODY—Streamline—Latest foreign design. TIRE IRONS—On rear. DRIVE SHAFT—Positively straight line. JOINTS—Spicer. SPRINGS—Longest flat springs for a car of its size in the world—three-quarters elliptic rear; semi-elliptic front. WHEELBASE—Extra long, 130 inches. BODY—Ample room for five passengers. UPHOLSTERY—Very deep. WINDSHIELD—Rain vision, ventilating. RADIATOR—German silver, cellular. CARBURETOR ADJUSTMENT—On dash. TOOL BOX—Under front seat—complete tool kit and jack; tire repair outfit. TIRE PUMP—Gear driven. SERVICE BRAKE EQUALIZER. LIGHTS—Powerful electric lights with dimming attachment for city driving. SPEEDOMETER—Flush faced. TOP—Silk mohair and Collins patented side curtains. HORN—Electric. TIRES—36" x 4". WHEELS—Wire.

Price \$2400

You will blame yourself if you do not get in line and secure an agency for the PULLMAN in your territory at once. Write or telegraph.

Pullman Motor Car Company

York, Pa.



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**SMALL
FOUR
\$1575**

WESTINGHOUSE
STARTING & LIGHTING
\$1775

**LARGE
FOUR
\$1975**

WESTINGHOUSE
STARTING & LIGHTING
INCLUDED

**SMALL
SIX
\$2400**

WESTINGHOUSE—
STARTING & LIGHTING
VULCAN ELECTRIC
GEAR SHIFT

**LARGE
SIX
\$2850**

WESTINGHOUSE—
STARTING & LIGHTING



Unexcelled American Genius Unexcelled American Skill Unexcelled American Manufacturing Processes

have produced the Unexcelled, American-made, New Departure ball bearing—the bearing that has proved its superiority by actual service in 80 per cent of American-made motor cars.

Three Types—

Double Row: A two-purpose bearing of maximum capacity for both radial and thrust loads.

Single Row: For radial loads only. An improved separator is an advantageous feature.

Radax: High grade, cup-and-cone type bearing for sustaining radial loads and one-direction thrusts.

Descriptive catalog will be sent on request.

Engineering consultation service at your command. Send us your blueprints, speed and load data and we will tell you what size and type of bearing will best do your work with greatest efficiency and least friction and wear.

"Elimination of Friction" brochure, now in third edition, discusses the relative merits of balls and rollers in bearing work. A copy will be sent you free on request.

The New Departure Mfg. Co. BRISTOL CONN.

Western Branch, 1016-17 Ford Building, Detroit, Mich.

"New Departure Ball Bearing Manual," full of information for the garage man and dealer, just off the press. The only book of its kind. Ask us for it.

Special data sheets on New Departure Self Aligning Shaft Hangers and use of New Departure Ball Bearings in machine tools, sent free on request. Address New Departure Mfg. Co., Hartford Division, Hartford, Conn., for them.

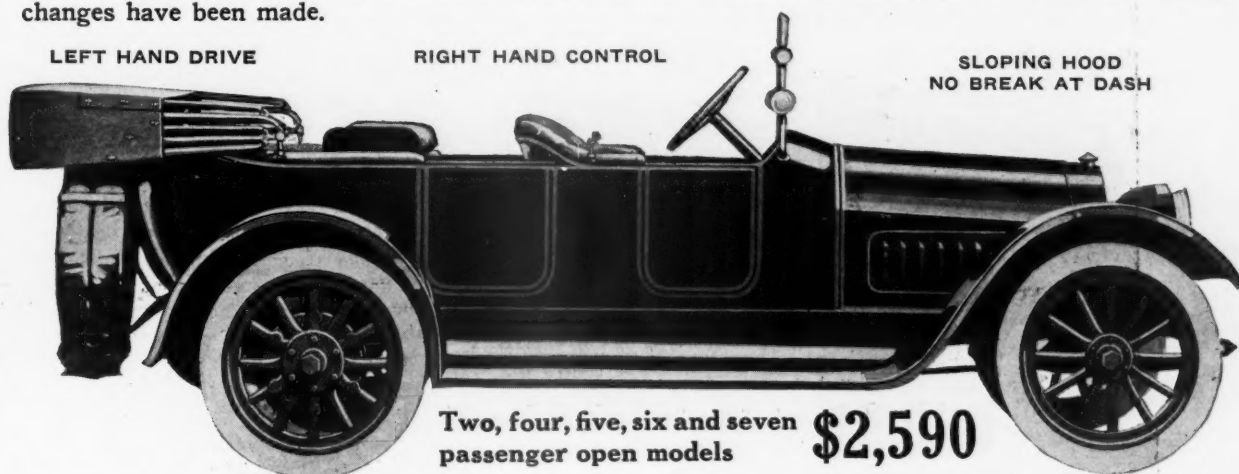
McFARLAN

ANNOUNCING THE IMPROVED SERIES T

A BIGGER car, but no heavier. A better car, but no higher in price. There is more room in the tonneau on all models. All seats are wider: Cushions are deeper. The radiator is larger and higher. The lines of the entire car have a much more generous, a much richer appearance than ever before. The stream line effect of the body and hood is beautiful. The air tank for the starting system is larger, so the starter will turn the motor longer and faster. The motor was nearly perfect, but room for a few refinements was found even in it. The rear axle has been refined and is even better than formerly. The air pump for the starting system is all metal and is oiled automatically. Every feature on the car is better than ever before, but even so, few radical changes have been made.

LEFT HAND DRIVE

RIGHT HAND CONTROL

SLOPING HOOD
NO BREAK AT DASH

Two, four, five, six and seven
passenger open models **\$2,590**

Four passenger Coupe, \$3,300

Seven passenger Limousine, \$4,000

Some Features

MOTOR: Six cylinders, cast enbloc 4" x 6". T head.

SELF STARTER: McFarlan Pneumatic. An absolutely positive motor starter. Fool proof. Entire system weighs but 38 pounds. Spins motor FAST. Pressure supplied by all metal pump.

TIRE INFLATOR: Four cylinder, engine driven pump. All metal.

ELECTRIC LIGHTS: From engine driven dynamo which runs at crankshaft speed.

REAR SPRINGS: $\frac{3}{4}$ Elliptic, Underslung. 56" long.

FRONT SPRINGS: 42" long.

REAR AXLE: Full floating. Very large shafts.

EQUIPMENT: Absolutely complete as shown except extra tires.

FRONT AXLE: Has ball bearing steering knuckles.

GASOLINE SUPPLY: From Cylindrical seamless steel tank on rear of frame. 22 gallons capacity.

TONNEAU ROOM: 40" from front of back seat to back of front seat in six and seven passenger models. 43" in Limousine.

TRUFFAULT HARTFORD SHOCK ABSORBERS.

WHEELBASE: 128".

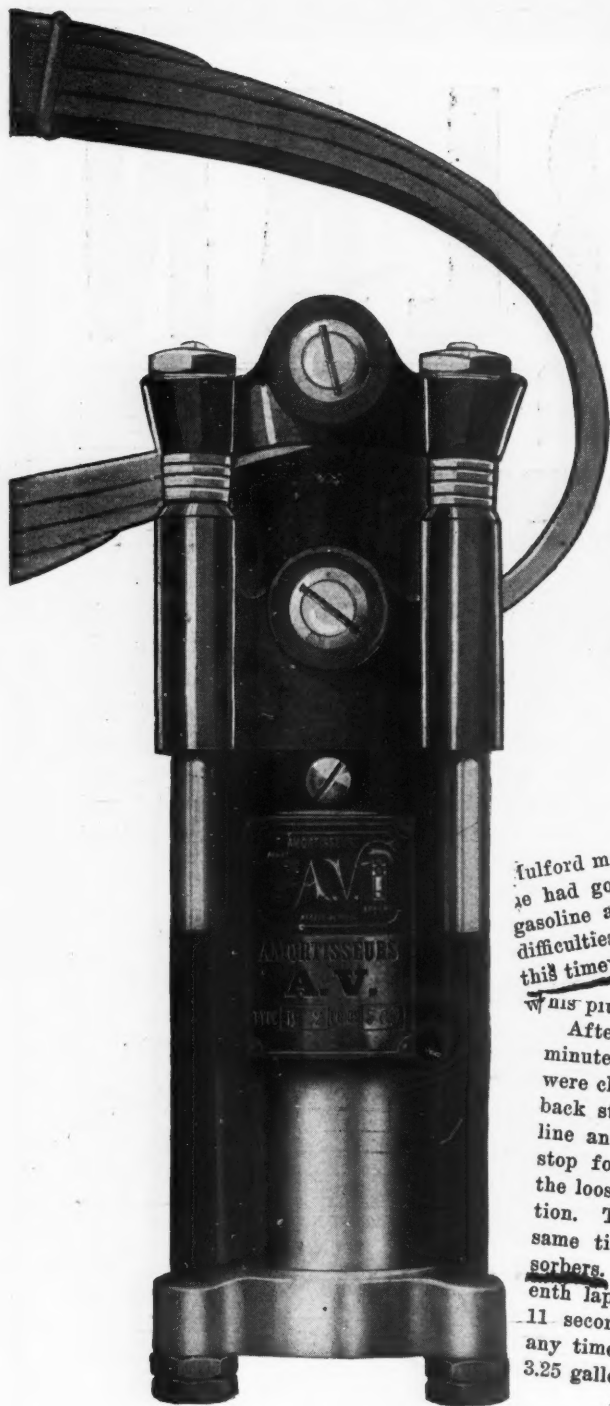
TIRES: 26 x 4 $\frac{1}{2}$ ". Firestone rims.

CUSHIONS: 11" thick. Very light, open bottom, sanitary type. Built to last.

The big new catalogue is ready for you. Address Desk E

McFarlan Motor Company

Connersville, Indiana



Hind Sight and Fore Sight or Echoes from Elgin USE The A.V.

(A. VERMERSCH & CIE)
LILLE, FRANCE

HYDRO-PNEUMATIC- SPRING SHOCK ABSORBER and win the race

Tulford made only one stop and this after he had gone 192 miles when he took on gasoline and oil. He had no mechanical difficulties, although occasion was taken at this time to straighten out a spring shackle turned over.

Wishart pit and had to back.

After twelve more laps he stopped for 2 minutes and 18 seconds while spare wheels were changed, due to a replacement on the back stretch, and fresh supplies of gasoline and water were taken on. The last stop for the Delta was necessitated by the loosening of the throttle lever connection. The opportunity was taken at the same time to tighten up the shock absorbers. This occurred in the twenty-seventh lap and held Dawson for 2 minutes 11 seconds. Dawson took on no oil at any time during the event and used only 3.25 gallons.

the flying studs. In addition to the tire trouble he broke two springs, putting in a new spring after the first break, a change of 24 minutes, and on the next lap he was held up for 1 minute because a bolt on the new spring had worked loose. When the new spring broke in identically the same place he abandoned the race.

Harry Endicott in the Endicott

Wishart Is Unlucky

Wishart in the Mercer was the unlucky driver of Friday's race. He made ten stops in the 200 miles before he finally went out with a broken spring, and in his ten stops he changed seven tires. He was using steel-studded tires on all four wheels

It absorbs the Rebound and the Downward Shocks. Relieve the strain on the driver, reduce the danger; eliminate shackles, Spring Breakage and tire troubles, and keep your car in the lead.

Made for both front and rear. Only 6" high. Sizes to suit the weight of the car and width of springs. Immediately applied in place of spring shackle without special attachments.

The springs cannot set and the device cannot break in action. Keep it partially filled with oil.

\$35 PER PAIR AND UP

We are establishing agents in all cities and towns.

HUDSON EXPORT AND IMPORT COMPANY

140 West 42d Street

RHINELAND MACHINE WORKS CO.,

1354 Michigan Avenue, Chicago, Ill.
650 Woodward Avenue, Detroit, Mich.

NEW YORK CITY

JOHN V. WILSON COMPANY,

1424 Vine St., Phila., Pa.
220 Motor Mart, Boston, Mass.

When Writing to Advertisers, Please Mention Motor Age.

Palma; Isotta, Grand Special, Erwin Bergdoll. The greater throng was attracted, perhaps, by the added elements of danger. Five men who drove their racers at a mile a minute speed for nearly five hours yesterday started out to repeat their performance. Their hands were blistered in holding the machines to the road in the rough spots, and they felt the effect of the journey in every muscle. This was especially true in the case of Harry Endicott, who fainted while on the 30th lap. He said he felt much better after a good sleep and that he expected to finish better than third, the position he was in yesterday when he succumbed to the strain. Ralph De Palma, who was bleeding at the nose when he finished first, had put charcoal in the driver's seat to relieve the heat. The Delta



Increases Motor Efficiency 33 $\frac{1}{3}$ %
Saves its cost in less gasoline consumption.

Assures Constant Electric Lighting
Installed easily, quickly and inexpensively

Splitdorf "Ford Special"

WATERPROOF HIGH-TENSION MAGNETO

The SPLITDORF ELECTRICAL CO. has harkened to the insistent demands of Ford owners and agents and has produced a thoroughly-tested high-tension magneto that promises to revolutionize the running of these remarkable cars.

Waterproof, and enclosed-gear driven, the Splitdorf "Ford Special" High-Tension Magneto is of special construction to meet the demands of Ford cars. With its installation the nuisance and expense of vibrators, coils and batteries pass away and a high-tension system secured that is second to none.

Write or Call Today upon our nearest Branch House for full information

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Factory: NEWARK, NEW JERSEY

Does Your Car Get On Your Nerves?

*Why Have a Car at all,
If You Can't Have Comfort?*

DO YOU come in from a run with your muscles tired and your nerves in a knot? Do your friends need a rest after riding with you? Does your wife prefer staying at home, because she can't enjoy the wearing, pulsatory shocks of your car? Is the rear seat constantly shaking with comfort-destroying vibration—even on good pavements? And have you thought that shock absorbers, easier springs, or deeper cushions might cure the discomfort?

That's the experience of thousands of car owners.

Motor-shot Shocks

Some cars are **never** comfortable. Cars so light that they are all the time bounding up from the road surface can **never** be made comfortable. And in your car—no matter how big it may be or how much you may have paid for it—if you can feel the impulses of your motor, you have an **incurable car**.

Waste no money on shock absorbers, easier springs, or deeper cushions, for these can **never** cure the nerve-eating

vibrations that are shot through a car by its motor.

Only One Relief

There is but one relief. Buy a car that does **not** vibrate, at any motor speed; one whose motor **never** transmits to the frame, the seats, and the passengers, that most painful evidence of faulty construction—weariness and nerve-racking jerkiness.

You get absolute freedom from motor vibration in the Winton Six. Whether running fast or slow, here is a motor producing its splendid power so smoothly and sweetly that you are never unpleasantly aware of its operations.

Here is Genuine Comfort

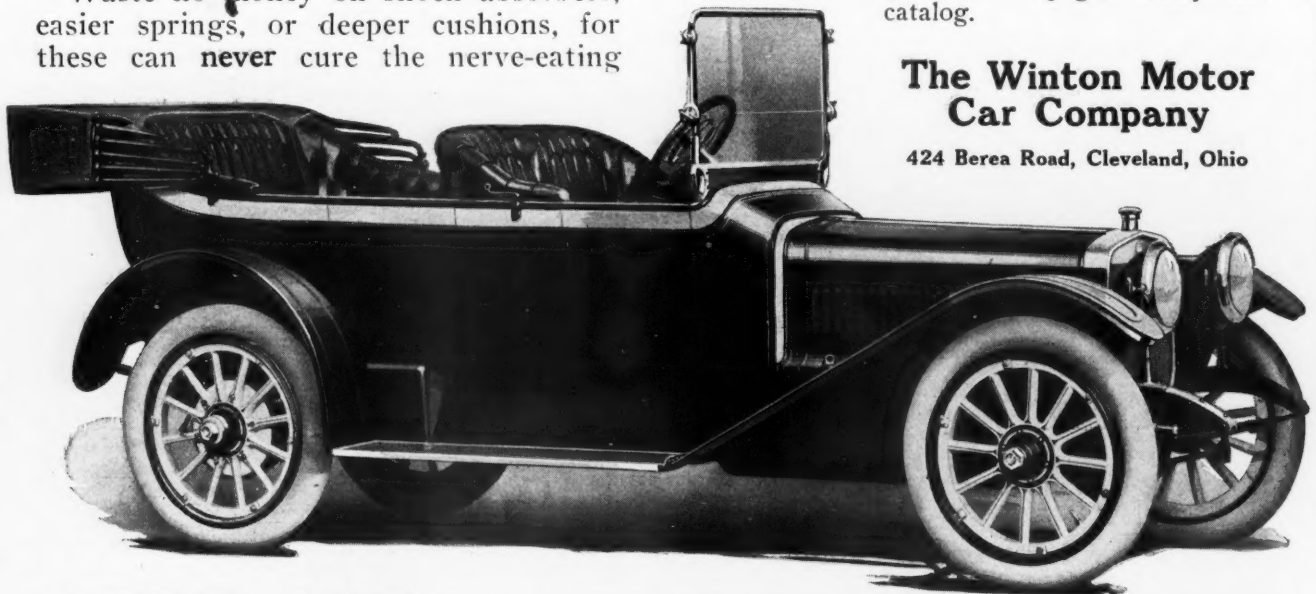
The Winton Six motor is the last word in automobile power plants. It is the **only** motor on the market today that, **in a single model**, has been undergoing a straightforward development toward perfection for more than **seven years**. Designed by Alexander Winton, the world's foremost six-cylinder specialist. Manufactured in our own plant, and built into the Winton Six **exclusively**. No other car in the world has a Winton Six motor.

Equipped with this superb motor, the Winton Six is easily the most restful riding car that travels American roads. You will realize the fullest meaning of automobile comfort when you own a Winton Six.

Let us send you our 64-page, library size catalog.

The Winton Motor Car Company

424 Berea Road, Cleveland, Ohio



WINTON SIX Long stroke motor, left drive, center control, electric lights, self-starter, finest mohair top, easily handled curtains, rain-vision glass front, best Warner speedometer, Waltham eight-day clock, Klaxon electric horn, tire carriers, four-cylinder tire pump, demountable rims, full set of tools, German silver radiator, metal parts nickel finished. Fully equipped,.....

\$3250



What's in A Name?

WHEN we stamp the name MULTIBESTOS in bold, bright letters on our brake lining we do more than make a selfish bid for your business—we do more than offer you a means of identifying MULTIBESTOS from the other linings not so good.

We say to you: Here is a brake lining we are proud of; a brake lining we are glad to have you compare with any other under any conditions of service; a brake lining which we, as manufacturers, stand back of with a most liberal guarantee.

Do you think we could afford to do this if we didn't feel sure that MULTIBESTOS is the best brake lining made?

Standard Woven Fabric Company

Framingham, Mass.

Sales Branches:

NEW YORK, 276 Canal Street

CHICAGO, 1430 Michigan Blvd.

PHILADELPHIA, 1427 Vine St.

BOSTON, 903 Boylston St.

SAN FRANCISCO, Fred Ward & Son, Inc.



1914 Overland

\$950

FROM any other factory, under any other name, such specifications cost \$1200.

The new 1914 Overland has a 114-inch wheelbase, a 35 horsepower motor, the roomiest body, the largest practical sized tires and electric lights.

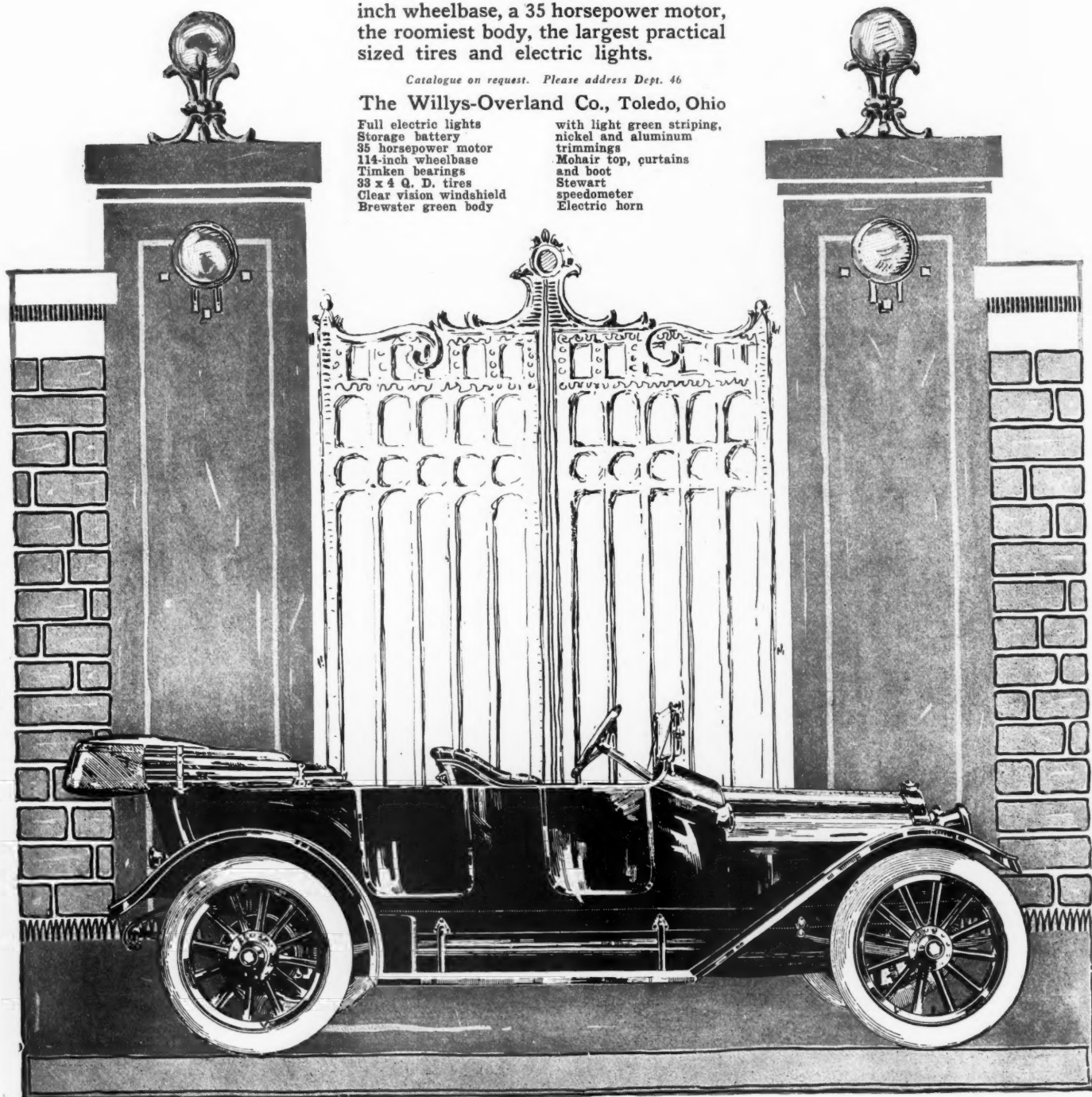
Catalogue on request. Please address Dept. 46

The Willys-Overland Co., Toledo, Ohio

Full electric lights
Storage battery
35 horsepower motor
114-inch wheelbase
Timken bearings
33 x 4 Q. D. tires
Clear vision windshield
Brewster green body

with light green striping,
nickel and aluminum
trimmings
Mohair top, curtains
and boot
Stewart
speedometer
Electric horn

*With Gray & Davis electric starter and generator—\$1075
Prices f. o. b. Toledo*



When Writing to Advertisers, Please Mention Motor Age.

The Indianapolis Star

IS ON YOUR LIST

If you propose to reach Indiana people who buy automobiles

The first eight months this year The Star carried 50,000 more lines of automobile advertising than any other Indianapolis newspaper.

**IF MORE EVIDENCE WERE NEEDED TO
DEMONSTRATE THE SUPERIORITY OF
THE STAR, CERTAINLY IT FOLLOWS:**

**Homer McKee, Director
Sales and Advertising,
Cole Motor Car Co.**

I never placed a piece of Cole copy in Indianapolis which was not given to The Star; furthermore, I have used The Star exclusively in Indianapolis on several occasions and have found the results highly satisfactory. The Star has intelligently co-operated with the automobile industry and built up a following which I believe second to none in the country in proportion to its field. Any automobile campaign in this territory which does not emphasize The Star would be tremendously crippled.

**J. Harding, Assistant
Sales Manager,
Prest-o-lite Co.**

We are glad to commend The Star as a medium for automobile advertising and to say that our experience with the paper has been entirely satisfactory. The Star has co-operated with us at many times and in many ways to make our advertising effective, and we are glad to assure you of our appreciation of the service.

**Eastern Representative
Kelly-Smith Co.
220 Fifth Avenue
New York**

**P. P. Willis, Advertising
Manager National Motor
Vehicle Company**

We believe that the sudden and universal use of the motor car has been due largely to the support of the newspapers and the use of the newspapers for advertising by the motor car makers and dealers. The writer can truthfully say that in Indiana, and even wider territory, The Indianapolis Star was first and has been most consistent and most liberal in supporting the motor car industry.

As an advertising medium, the best recommendation the writer can give is that The Star continues year after year to carry the most of our business, as it does for many other companies.

**H. H. Rice, Automobile
Sales Department,
Nordyke & Marmon Co.**

We have, as you know, used The Indianapolis Star for a number of years regularly, and believe it to be one of the best newspaper mediums in this locality for high-class automobile advertising we know of.

Our continued use of your advertising columns should surely be good evidence of our opinion of their value.

**Western Representative
John Glass
Peoples Gas Building
Chicago**

60,000 FORD OWNERS USE

The Master Vibrator



Price, \$15.00

AND HAVE THAT SATISFIED FEELING

because the K-W Master Vibrator increases the efficiency of their cars by giving a

A Hotter Spark More Power

A Smoother Running Engine

Less Carbon Deposits

Easier Starting

Cleaner Spark Plugs



An honest article at a fair price—large, powerful condenser, genuine solid platinum-iridium points of generous size, strongly built kick switch—

The Standard By Which All Others Are Judged

OUR GUARANTEE—Try the K-W Master Vibrator for 30 days and if you can get along without it, return it and we will give you your money back and ask no questions. **SEND FOR DESCRIPTIVE FOLDER**

SIMPLE, EFFICIENT AND ECONOMICAL

The Electric Headlight Outfit

\$40



Complete Outfit, Electric Generator, Headlamps, Switch, Wire and Bulbs

EASY TO INSTALL

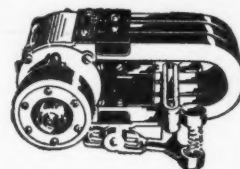
MOUNT IT IN ANY POSITION

Runs in either direction

Has only one moving part

No commutator or brushes

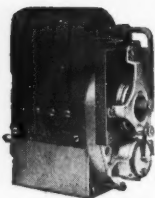
Gives two 1,600 C. P. headlights



Send for descriptive folder

We also make a

Ford Outfit For Fly-Wheel Magneto, \$15.00



The High Tension Magneto

The strongest made for the largest engine made. Positive results and entire satisfaction guaranteed. Give description of engine and ask for price. You can't make an engine too big for the K-W. No batteries needed to start.

WE PREPAY THE EXPRESS all the way on the K-W Master Vibrator and East of the Mississippi River on all our other goods when cash accompanies the order



Give the Street Number →

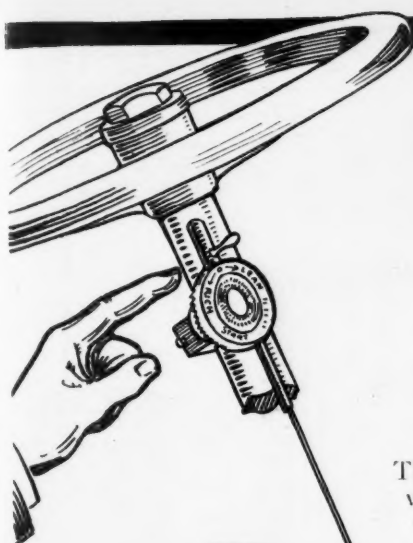
2835 CHESTER AVE.

CLEVELAND, OHIO. U.S.A.

Agents in principal cities.

NEW YORK, E. J. Edmond, 1783 Broadway.

BOSTON, W. J. Forbes, 243 Columbus Ave.



**SHIFT
THIS LEVER AND
FORGET THE WEATHER**

It is possible to adjust ordinary carburetors so that they work all right at high speed, and again at low speed; but whether the carburetor delivers a mixture of highest power and economy between these speeds is purely a matter of guess work.

The MOTSINGER CARBURETOR is built on an entirely different principle, the "keep step" principle. The MOTSINGER auxiliary air valve is so shaped that for each equal additional lift of the valve, an equal additional amount of air is delivered. The gasoline needle is so shaped that for each additional lift of the needle, an equal additional amount of gasoline is delivered. The quantity of gasoline "keeps step" at all times with the amount of air. The ratio is always directly proportional.

Unlike with ordinary carburetors, it is possible with a MOTSINGER to know that your mixture at all speeds is always right—always economical, always powerful.

With a MOTSINGER, you simply shift the steering post lever until your engine works perfectly. You have then determined a balanced mixture. Once this balance is found, it will be maintained by the automatic construction of the MOTSINGER throughout the entire range of running, from "idle" to the greatest horse power your motor is capable of producing. You need never readjust this balance, except to take care of noticeable changes in temperature, altitude or humidity.

You adjust your steering post lever on the same principle you adjust the screw in a pair of scales, to see that they balance perfectly. Once perfectly balanced, due to their automatic construction, the scales will accurately weigh any article within their limit. Similarly, the MOTSINGER delivers a just right mixture throughout its entire range.

MOTSINGER DEVICE MANUFACTURING CO.,
867 Putnam Street, Lafayette,⁵ Ind.

CHICAGO DISTRIBUTORS

O. JUNKERS

1806 Michigan Avenue.....CHICAGO, ILLINOIS

It works on the principle of a pair of scales

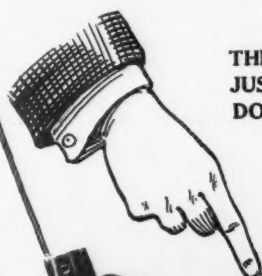
Motsinger Carburetor

**increased
mileage
guaranteed**

The MOTSINGER Carburetor is equipped with a steering post control which enables you to "weigh out" a just-right mixture for every condition of temperature, altitude and humidity.

For example, in winter a greater quantity of gasoline is required for starting than in summer. Ordinary carburetors are adjusted with only one end in view; i. e., to give this rich starting mixture. The result is that throughout their entire range—at low, intermediate and high speeds—they are feeding the motor during the winter, an over-rich, highly wasteful mixture. Not so with the MOTSINGER. Practically on the same principle as a pair of scales, a rich starting mixture is proportioned out, and then after the motor has "warmed up" the mixture is thinned out by shifting the MOTSINGER steering post lever to conform to the new temperature conditions caused by the motor "warming up." Every drop of gasoline is utilized, converted into power.

With a MOTSINGER it is possible to readjust your carburetor, without once raising the hood, to meet every temperature condition through the year.



**THE LEVER "WEIGHS OUT" A
JUST-RIGHT MIXTURE
DOWN HERE**



The
Motsinger
Is
Guaranteed
to
Increase
Your Mileage
or
Your Money
Refunded

**TRY ONE
FREE
ON YOUR
CAR OR
TRUCK FOR
30
DAYS**

Hyatt Roller Bearings are self cleaning.

Grit and dirt that in a solid roller or ball bearing would grind between the bearing surfaces, is forced into the center of the hollow Hyatt Roller through the spirals.

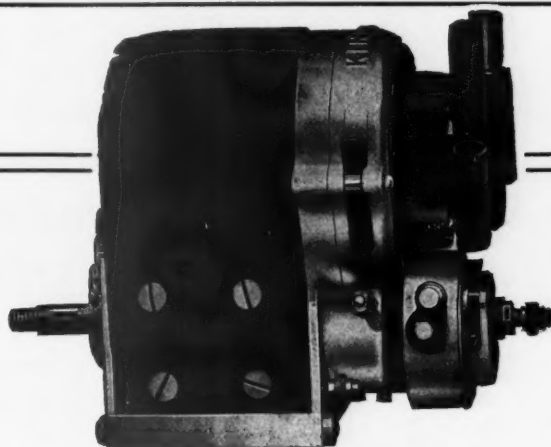
This keeps the bearing exceptionally free from foreign matter and thus materially increases its life.

A book on Motor Car Bearings—another for Automobile Owners will be sent for the asking

"Hyatt Quiet Bearings"



HYATT ROLLER BEARING CO.
DETROIT, CHICAGO
NEWARK, N.J.



Model "B" Magneto

Motor Car Manufacturers Looking for "The Most Efficient Ignition" Invariably Settle on the

IMPROVED KINGSTON MAGNETO

KINGSTON Ignition Appliances were created coincident with the birth of the automobile. From the beginning they have been noted for their **reliability**. KINGSTON Magnetos, Spark Coils, Spark Plugs, Switches, etc., are made with the greatest accuracy by the most skilled engineers obtainable. They cannot be improved upon because we keep improving them ourselves as fast as science knows how.

KINGSTON Magnetos are made for high or low-tension systems, for heavy or light duty. They are made with the greatest precision—are as nearly perfect as it is possible for them to be built. Scores of car manufacturers and thousands of individual owners who are using them would not use the best substitute at any price. Those who are best acquainted with the motor situation in America are the most enthusiastic KINGSTON boosters.

Let us tell you why KINGSTON Magnetos and Electrical Appliances are **best** for the automobile. Write us.

KOKOMO ELECTRIC COMPANY KOKOMO, INDIANA

BRANCHES:

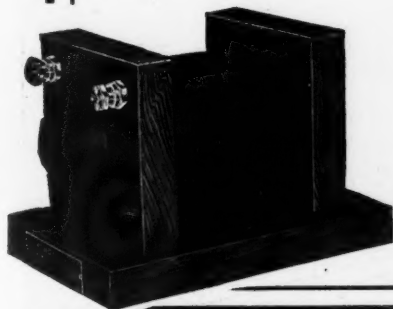
Chicago, 1430 Michigan Avenue

Detroit, 650 Woodward Avenue

Seattle, 718-20 Central Building

New York, 1733 Broadway

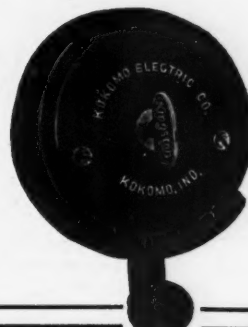
Los Angeles, 332 Pico Street

Covered Vibrator
Box CoilA. L. A. M. Standard
Plug

Special Block Make and Break Coil



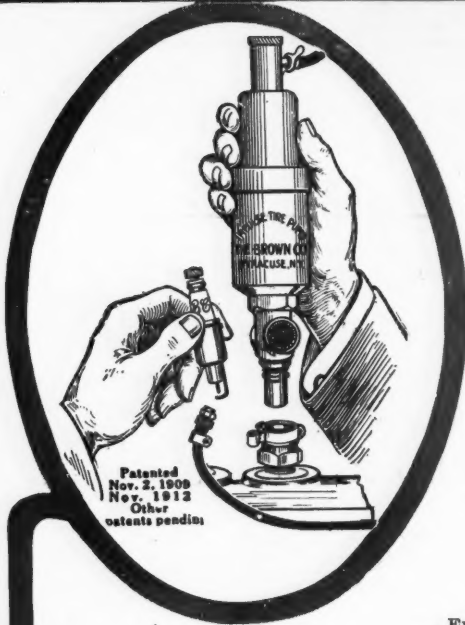
Dash Board Transformer



Kingston Switch

When Writing to Advertisers, Please Mention Motor Age.

THE BROWN IMPULSE TIRE PUMP



A Necessity—Not An Accessory The Brown Impulse Tire Pump WITH The B'Co Quick Detachable Spark Plug

You don't want to pump up your tires by hand. Nobody does. It's a slow, hard, dirty, back-breaking task. It wastes time and tries tempers; ruins clothes and spoils pleasure.

For Your Own Sake a Brown Outfit Is a Necessity

Tire troubles are the worst troubles the motorist of today encounters. More than half of the tire troubles are caused by under inflation. You can't get a seventy or eighty pound pressure with a hand pump no matter how hard you try. The Brown Impulse Tire Pump will give you eighty pounds or one hundred in from two to four minutes.

For Your Tires' Sake Get a Brown

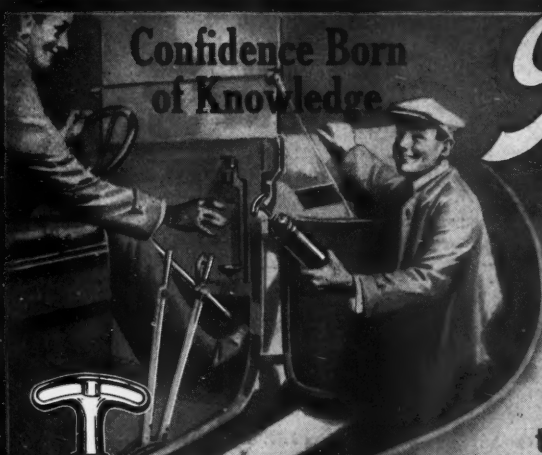
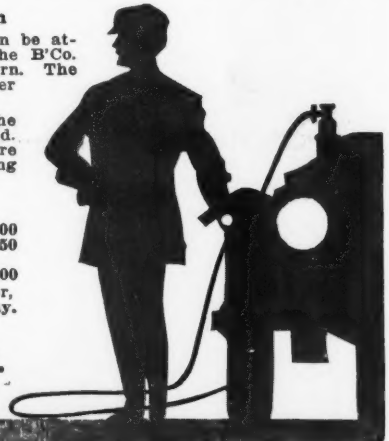
It's the handiest pump to use because it can be attached and detached without a wrench. The B'Co. Q. D. Spark Plug lifts out with a quarter turn. The BROWN PUMP drops in and seats with another quarter turn.

Simple, practical, economical, durable—the greatest time, labor and tire saver ever devised. Be sure you get a BROWN. It's the only tire pump that includes a Spark Plug and Recording Gauge as part of its regular equipment.

Price, complete, including hose, self-opening valve connection, Recording Gauge and B'CO Q. D. SPARK PLUG.....\$15.00
Extra B'Co. Spark Plugs..... 1.50
Previous models of the BROWN PUMP made over to fit this new connection.... 2.00

Every day you delay investigating is costing you labor, annoyance and money. Ask your dealer or write us today.

The Brown Company, 120 Bellevue, Syracuse, N. Y.



Confidence Born
of Knowledge

Pyrene
TRADE MARK
FIRE
EXTINGUISHER

Brass and Nickel-plated Pyrene Fire Extinguishers are the only one-quart fire extinguishers included in the Lists of Approved Fire Appliances issued by the National Board of Fire Underwriters.

Will instantly smother the most stubborn gasoline fire.

A gas blanket which completely cuts off the air supply and smothers the flame is formed when Pyrene Liquid comes in contact with heat.



Offices
Atlanta
Baltimore
Boston
Buffalo
Chicago
Dayton
Denver
Louisville
Memphis
Norfolk
Oklahoma City
Pittsburgh
St. Louis
San Antonio
York, Neb.

Used by the Standard Oil Companies, railroads, traction and power companies, and industrial corporations throughout the United States

Write for Booklet

PYRENE MFG. CO., 1358 Broadway, New York

LACK OF PYRENE PROTECTION
MAY MAKE *YOUR* CAR
"A SKELETON ON THE ROAD"

Pacific Coast
Distributors
Gorham
Engineering Co.
San Francisco
Los Angeles
Seattle

There are 102,965 Motor Cars owned by 265,000 Digest subscribers. These facts are presented in convincing form, a copy of the circular will be mailed on request. Families owning cars are the best possible prospects for new cars and the reason for the vast amount of automobiles advertising in the Digest is apparent.

Automobile Advertising in The Literary Digest First Eight Months of 1913

The Abbott Motor Company	- -	1260 Lines
Anderson Electric Car Company	-	1708 "
Baker Motor Vehicle Company	-	840 "
Borland-Grannis Company	- -	448 "
Cadillac Motor Car Co.	- -	2520 "
Chalmers Motor Company	- -	1904 "
Cutting Motor Car Co.	- -	224 "
Elkhart Carriage & Harness Co.	-	168 "
Franklin Automobile Company	-	2940 "
The Garford Company (Garford Car)	-	2940 "
Haynes Automobile Company	- -	1680 "
Hudson Motor Car Company	- -	2940 "
Hupp Motor Car Co. (Hupmobile)	-	1568 "
Jackson Automobile Company	- -	1708 "
Locomobile Co. of America	- -	1260 "
Lozier Motor Company	- -	1680 "
The Maxwell Motor Company	- -	420 "
C. H. Metz	- - -	140 "
Michigan Motor Car Company	-	1260 "
Mitchell-Lewis Motor Car Company	-	420 "
National Motor Vehicle Company	-	617 "
Nordyke & Marmon Company	-	1260 "
Norwalk Motor Car Company	- -	420 "
Oakland Motor Car Company	- -	420 "
Olds Motor Works	- - -	1680 "
R. M. Owen & Co. (Reo Motor Car)	-	2940 "
Packard Motor Car Company	- -	1680 "
Pierce-Arrow Motor Car Company	-	2100 "
Rauch & Lang Carriage Company	-	896 "
The Velie Motor Vehicle Company	-	420 "
The Waverley Company	- -	840 "
The Willys-Overland Company	-	2940 "
The Winton Motor Car Company	-	840 "
Total		- 45,081 Lines

The greatest number of automobile and truck accounts (January-August, 1913) are credited to THE LITERARY DIGEST. Forty-four (44) different makes have advertised with us in these eight months.

Motor Truck Advertising in The Literary Digest First Eight Months of 1913

American Locomotive Company	-	420 Lines
Anderson Electric Car Company	-	840 "
Electric Vehicle Association of America	-	560 "
Federal Motor Truck Company	-	1316 "
The Garford Company	- - -	420 "
General Vehicle Company	- -	280 "
Gramm Motor Truck Company	-	840 "
International Harvester Company	-	448 "
International Motor Company	- -	1260 "
Kelly-Springfield Motor Truck Co.	-	420 "
Packard Motor Car Company	- -	840 "
M. Rumely Company	- - -	420 "
The Waverley Company	- - -	420 "
The White Company	- - -	3360 "
Willys-Overland Company (Utility Truck)	- - - -	840 "
Total		- 12,684 Lines

Standing of Magazines in Motor Truck Advertising First Eight Months of 1913

Literary Digest	- - - -	12684 Lines
Collier's	- - - -	9277 "
Life	- - - -	8008 "
Post	- - - -	7256 "
World's Work	- - - -	2912 "
System	- - - -	2744 "
Review of Reviews	- - - -	2688 "
Leslie's	- - - -	2400 "
Country Life	- - - -	896 "
Scribner's	- - - -	672 "
McClure's	- - - -	672 "
Everybody's	- - - -	672 "
Christian Herald	- - - -	558 "
Cosmopolitan	- - - -	224 "
Munsey's	- - - -	112 "

Summary First Eight Months of 1913

Automobile Advertising in The Digest	-	45081 Lines
Motor Truck " " " "	-	12684 "
Tire Advertising in The Digest	- -	28095 "
Accessory " " " "	- -	22051 "
Total		- 107,911 Lines

The Literary Digest

When Writing to Advertisers, Please Mention Motor Age.

CLEANS FOUR CYLINDERS IN THIRTY MINUTES!

And does it thoroughly without any manual labor on your part. It chases carbons from every nook and cranny in the cylinder, and leaves the walls in shining condition.

With it you don't have to tie up your customer's car indefinitely while you scrape and rub and labor in the old-fashioned way. This item of labor alone runs into many dollars and cuts your profits way down on the standard rate of \$1 per cylinder. With the

**COX OXYGEN
CARBON**



CLEANER

in your garage, repair shop or service station you have a device that not only shows an almost gross profit, but which also makes cylinder cleaning a positive pleasure.

With it you can give the car owner a better job in less time, and if you want to, for less money than you could have ever done by the old-fashioned method.

Write for our literature. It presents some startling facts. You owe it to yourself and your business to at least investigate.

Do it to-day.

Cox Brass Manufacturing Company

ALBANY, N. Y.
No. Pearl and Van Woert Sts.

NEW YORK CITY
1777 Broadway

DETROIT, MICH.
870 Woodward Ave.

One Garage
Cleared

\$90

In One Week
Through
Using
This \$25 Device



Contracts Now Being Made for 1914 Agencies

Model 36-42
5- Passenger
Touring—
Fully Equipped
With Electric
Self-Starter



Dodge

\$1840

The Car That Looks and Acts the Thoroughbred It Is!

The man about to buy a car or the dealer contracting for deliveries is doing himself an injustice if he does not fully investigate the *Glide* 36-42 before deciding on any make car, regardless of price.

The *Glide* is a big, roomy, powerful five-passenger car that possesses features of construction and equipment rarely found on a machine selling for \$3,000 and upwards.

If you've got a wrong impression of the *Glide* because it sells for only \$1840, read a brief outline of the car given here and you'll see that the *Glide* is not a "cheap" car, but, in the strictest sense of the word, that it is a car of quality.

Automatic Dynamo Lighting System
Unit Power Plant
Long Stroke Motor with enclosed valves
Left Side Drive
Electric Side Lamps in Dash
Floating Rear Axle with Pressed Steel Housing
Westinghouse Electric Self-Starter

Demountable Rims (Baker Bolted-on)
118-inch Wheel Base
Motor-Driven Tire Pump
Center Control
Electric Headlights and Tail Lamp
Goodyear No-Rim-Cut Tires

Thousands of these cars are running season after season with entire satisfaction to the owners and with no responsibility to the dealer.

Dealers are rapidly applying for agency contracts to sell the *Glide* through 1914 season, but there is still much desirable territory, which we will assign to those who are prepared to represent us intelligently and aggressively. Write for catalog, agency proposition and full information.

The Bartholomew Company

215 Glide Street, Peoria, Illinois

SPECIFY

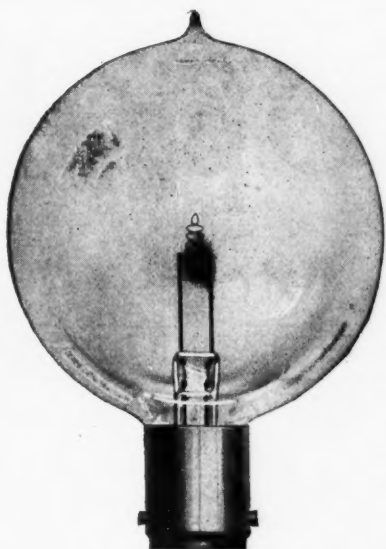
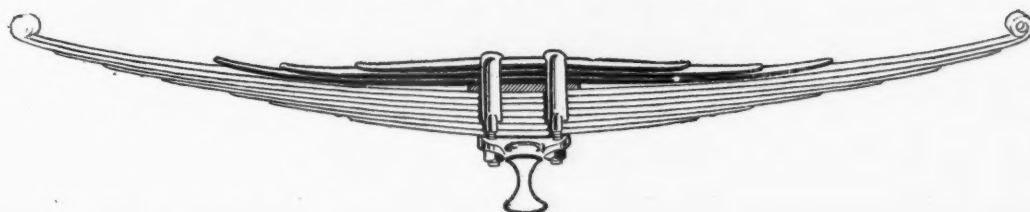
The
AMES
AUTOMATIC
SHOCK ABSORBER

AND END YOUR SPRING TROUBLES

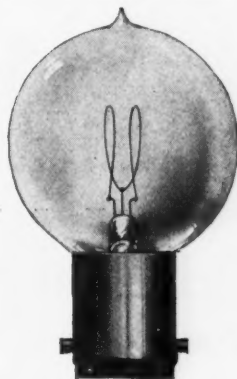
CLARENCE N. PEACOCK & CO.

Exclusive Licensees

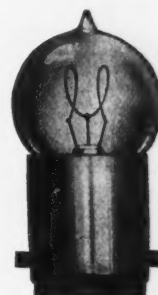
1788 BROADWAY, NEW YORK



Head



Side



Rear

The Right Lamp for the Right System

We co-operate closely with car builders and the makers of lighting systems in the manufacture of Edison Mazda (drawn wire tungsten) Lamps for automobile service. When **Edison Mazda Lamps** are used, car owners are assured of getting the right kind of lamp to meet the requirements of different lighting systems.

We supply lamps for any make of car and standard lighting system, with either the double contact bayonet candelabra base or single contact bayonet candelabra base, using ground return.

Edison Mazda Lamps are on all the representative cars—adopted as standard by car manufacturers, because of their successful and continued operation.

This detailed manufacture—making the lamp to fit the lighting system—cannot help but ensure the most satisfactory and efficient service.

All over the country there are Service Stations established where **Edison Mazda Lamps** for renewals may be readily obtained.



Edison Lamp Dept.

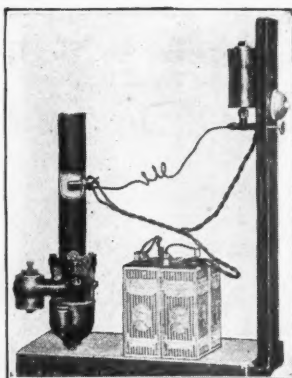
GENERAL ELECTRIC COMPANY

Lamp Agencies Everywhere

Harrison, N. J.

(4213)

When Writing to Advertisers, Please Mention Motor Age.



Volcano ELECTRIC Primer

(PAT. PENDING)

MR. CAR OWNER: You realize the difficulty of motor starting in winter, due to the nonvaporizing of gasoline. You can overcome all of this trouble by using a VOLCANO ELECTRIC PRIMER, the only primer today that actually uses **electric current** for priming. With this primer all spinning of the motor is eliminated, no matter how cold the motor may be. Your motor will start as easy at 20° below zero as it will 100° above. A trial of this primer will prove these claims.

Price \$10.00

Spins Motor 200 Times On One Priming

MR. SELF-CRANKING CAR OWNER: Your self-starter is not complete without an Electric Primer. Because it is no strain on you to sit and hear your little starting motor tugging away at the big 50 H.P. motor your car carries, is no sign it is not working hard.

Equip with a VOLCANO ELECTRIC PRIMER, make its work easier, prolong its life, relieve the storage batteries of this great strain. Make starting a pleasure, not a task. The operating levers of this primer are

located on the dash, and are controlled by the toe, as easily as throwing on the starting switch.

THE VOLCANO ELECTRIC PRIMER primes the motor with explosive gas generated from explosive gasoline, using **electric current** supplied by dry batteries. There is no waiting for generating. It generates in three seconds with one priming. It turns the motor over 200 times, giving the motor a chance to run on its own gas. The capacity of the primer is 100 primings with one filling.

READ THIS TEST A 30 H. P. motor, temperature below freezing, was primed with a VOLCANO ELECTRIC PRIMER (generated in 3 seconds). By pulling up twice on the crank the motor started. All spinning was eliminated. The motor turned over 200 times on the one priming. The amount of current used by the starting batteries was negligible. The VOLCANO can be mounted on any size or make of motor in 30 minutes. A trial will prove our claims.

DEALERS: Write for agents' proposition in unallotted territory. Some valuable territory still open. Get in touch with us before it is too late. Write us at once.

Volcano Electric Primer Works, Virginia, Illinois

The Metropol

Introducing a New Era in Automobile Building

The Real Long Stroke Motor

25 MILES ON A GALLON

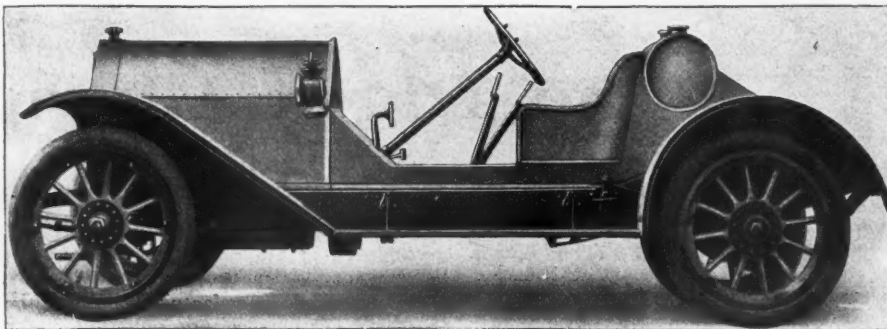
4 1/4 Inch Bore

(Perfected)

7 1/8 Inch Stroke

75 MILES AN HOUR

A Construction heavy and strong enough to transmit big power, but very light and very simply designed.



A Motor of 4 1/4" bore, rated 30 H.P., but developing 90 H.P., on brake test. More flexible than the ordinary 6-cylinder motor.

Model C \$1350 Speedster

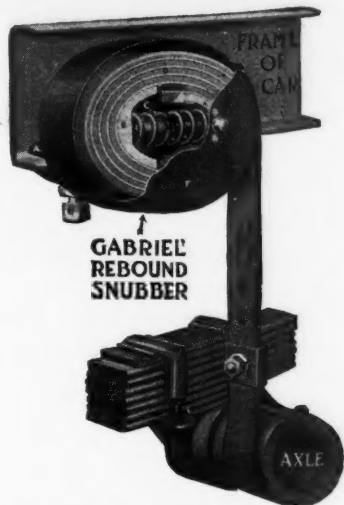
A powerful speed car that can be purchased and operated at very low cost

Some desirable territory open to agents and distributors

Metropol Motors Corporation, 1926 Broadway, New York

When Writing to Advertisers, Please Mention Motor Age.

GABRIEL Rebound Snubbers



Easy to put on. No drilling or otherwise marring the car. Noiseless at all times. No further adjustment required and will outlast the car.

Don't Buy a Discounted Car

When you buy an up-to-date model you have a right to expect up-to-date equipment. A 1914 car without an up-to-date auxiliary device for its springs, or a car with an out-of-date one, is already discounted.

There is no longer any question which device is the up-to-date one—it is Gabriel Rebound Snubbers. The foremost automobile engineers of America and Europe have settled that. Hence Gabriels are being used in increasing quantities by practically all the leading car builders.

Gabriel Snubbers Will Outnumber All Others on 1914 Autos

Standard Factory Equipment on the 7 Easiest Riding and Leading Cars

Whether you get Gabriel Rebound Snubbers now or not, you pay for them sooner or later anyway in repair bills and short mileage, besides missing the easy riding every day. Specify Gabriel Rebound Snubbers and start right.

Live Agents Wanted

GABRIEL HORN MFG. CO.

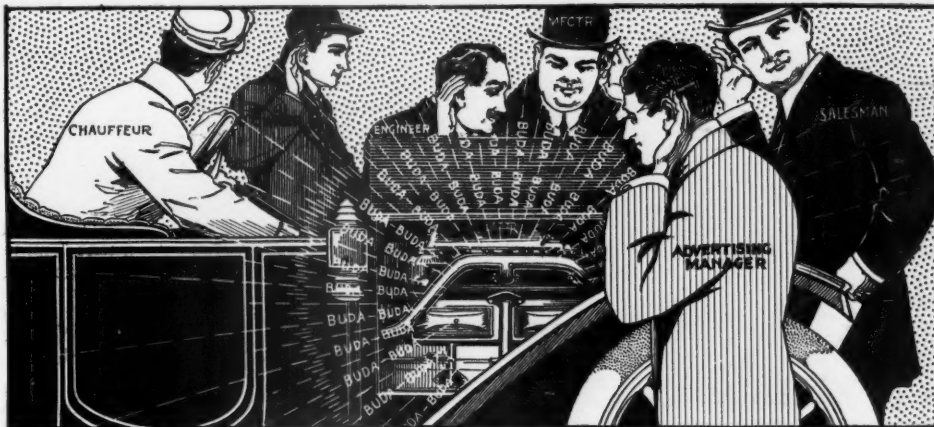
1415 E. 40th St.

Cleveland, Ohio

Makers of the famous GABRIEL Musical Horns and Auto Accessories

LISTEN! HERE IS AN IMPORTANT MESSAGE:

The Part that Sells the Car—that Sells the Car—that Sells the Car—that Sells the Car—



The Part that Sells the Car—that Sells the Car—that Sells the Car—that Sells the Car—

The silent Buda motor does its own talking—and yours.

WISE MANUFACTURERS HAVE BUDA MOTOR FOR THEIR "SILENT SALES MANAGER."

"The Pioneer in America of the"

BUDA MOTOR

Cast-in-block construction."

Ask Us.

"The Part That Sells the Car"

Write Us.

THE BUDA COMPANY, FACTORY, HARVEY, ILL. (Chicago Suburb)

Address all communications to our
1108 S. MICHIGAN, AVE., CHICAGO

FACTORY REPRESENTATIVES BRANDENBURG & COMPANY
57TH AND BROADWAY, NEW YORK, N. Y.

FORD BUILDING, DETROIT

When Writing to Advertisers, Please Mention Motor Age.

Here's a High Grade Motor Truck Easy to Buy, Easy to Operate and Easy to Pay For

You couldn't ask for more than we offer you in the

Selden One-Ton Truck

every feature of which compares favorably with trucks selling for double the money.

The price is \$2000 but so confident are we of the absolute dependability of this truck that we let you put it into service upon payment of only \$500 down and the balance in twelve monthly installments of \$125 each. This practically allows the Selden to earn its cost during the time you have to pay for it.

THE SELDEN TIME PAYMENT PLAN

has proved popular with hundreds of firms that did not feel that they could spare the full purchase price from their working capital at one time, and should appeal to you.

Investigation will prove the Selden is the Truck you want and on terms that you can afford.

Agents wanted in unassigned territory

Selden Truck Sales Company

265 East Avenue

Pioneers in Selling Trucks on Time

Rochester, N. Y.



HESS-BRIGHT

BUILT FOR ENDURANCE

The extremely accurate instruments employed and the precision demanded—plus the painstaking care in manufacturing—are the underlying reasons why HESS-BRIGHT BALL BEARINGS last.

Only by having the most extensive plant in existence—and the most wonderful resources—can it be possible to fill more than half of the world's demand for annular ball bearings.

THE HESS-BRIGHT MANUFACTURING CO.

Front Street and Erie Avenue
On N. Y. Division of Penn. R. R.
PHILADELPHIA, PA.

Stores for Retail Distribution
Philadelphia—666 North Broad Street
New York—1974 Broadway
Chicago—1800 Michigan Avenue

A FOREST OF GRINDERS!

A view in one of the grinding rooms of the plant producing HESS-BRIGHT (D W F) BALL BEARINGS. These special machines are for grinding the circular grooves or ball races.

76-1

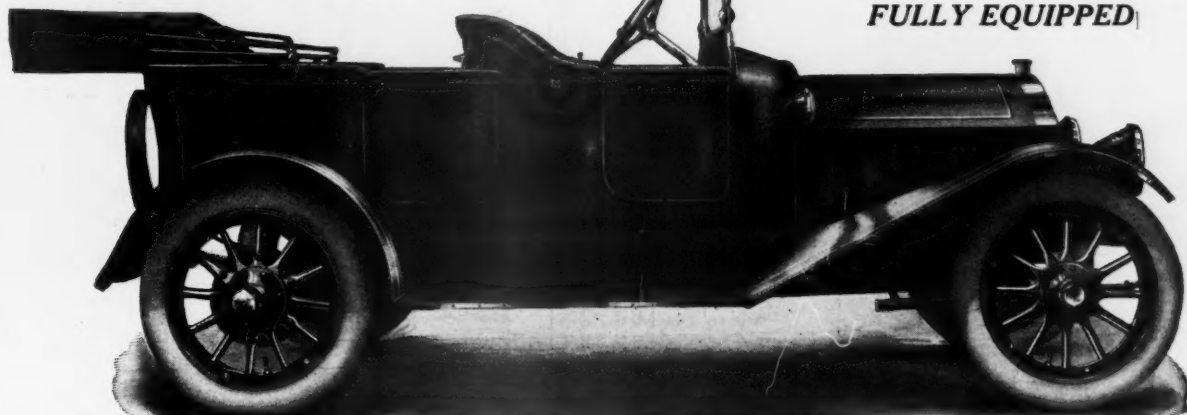
When Writing to Advertisers, Please Mention Motor Age.

**ELECTRIC Lighted and Started
Marathon "Winner"**

40 h. p., 118 Wheel Base

\$1325

FULLY EQUIPPED



**MARATHON Automobiles Offer the Best Dealer Proposition
in the Automobile Business Today**

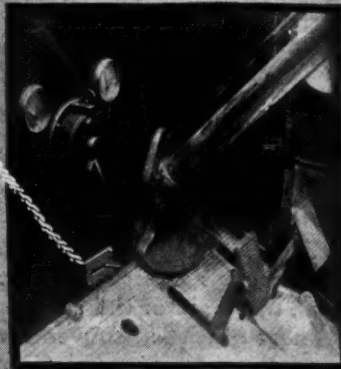
There isn't a car on the market that is its equal as a self-seller. In size, looks, power, mechanical efficiency and complete equipment, it compares more than favorably with the much higher priced cars.

*40-h. p., 118-in. Wheel Base—Beautifully designed—Luxuriously upholstered
mechanically complete—Electric lighted and started—Perfectly equipped—\$1325*

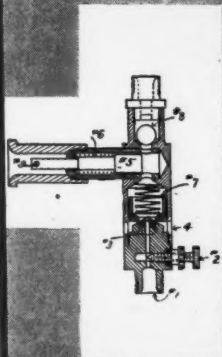
Simply can't be beat—no other dealer can compete. Six Marathon models in all, from \$925 to \$1495.

Dealers' territory nearly all assigned—Maybe yours is still open. Better write or wire today to

HERFF-BROOKS CORPORATION, Indianapolis, Indiana



No Priming Needed—the **EXTRA-JET** *Makes Starting Easier*



No wise motorist today overlooks any device which will increase the efficiency of the car he drives; and of course every motorist is willing to install a device that will decrease his cost of up-keep.

THE EXTRA JET INCREASES EFFICIENCY AND SAVES MONEY

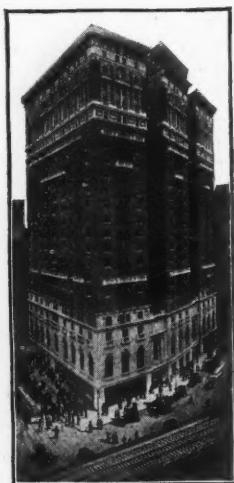
It is practically an extra jet for your carburetor, which supplies a rich mixture for starting and enables you to set the carburetor for correct running mixture; it will start your motor on the third or fourth pull even in zero weather. With electric starters it saves batteries and wear on the starter, in addition to fuel economy and elimination of priming. The Extra Jet is very simple in construction, and is easily attached; no soldering or machining required. Nothing but a small lever is seen on the dash. Try it for ten days. So necessary a part of your car will it become that you'll never part with it.

Price \$5.00, Complete

Your money back if not satisfied. Write for circular—NOW

Dealers: Here's something new that sells easily and leaves a handsome profit. Get a sample today

WELD MFG CO
NORTH CHATHAM MASS.



When you are in New York

—either for a brief visit or a prolonged stay—the important question of where to live is best answered in the Hotel McAlpin.

It is the world's largest and safest hotel—renowned for its

**Luxurious, home-like comfort
Wonderfully efficient service
Exceptionally central location
Notable moderation in prices**

Distinctive surroundings—perfect appointments—unexcelled cuisine—the character of accommodations you have always sought at the prices you have always wanted to pay.

Situated at Broadway and 34th Street—the axis of the city's transportation systems—on the threshold of the shopping and amusement districts. Conveniently accessible to Pennsylvania and Grand Central Stations.

Management of MERRY & BOOMER

HOTEL McALPIN

Herald Square

NEW YORK

Nearer than Anything to Everything



V. M. McAlpin

GAS, GASOLINE and OIL ENGINES

INCLUDING GAS PRODUCER PLANTS



Sixteenth edition.
Revised, enlarged and reset.

By
**GARDNER D. HISCOX
M. E.**

Author of
"Mechanical Movements,"
"Compressed Air,"
Etc., Etc.

Price, \$2.50

Charges Prepaid



THE only complete American book on the subject for Gas Engine Owners, Gas Engineers, and intending purchasers of gas engines, treating fully on the construction, installation, operation and maintenance of gas, gasoline, kerosene and crude petroleum engines.

The new rewritten, enlarged and revised 16th edition of this work has been prepared to meet the increasing demand for a thorough treatise on the subject. Its 450 pages give general information for everyone interested in this popular motive power, and its adaptation to the increasing demand for a cheap and easily managed motor requiring no licensed engineer. It is fully illustrated by 351 Engravings and Diagrams.

CONTENTS.

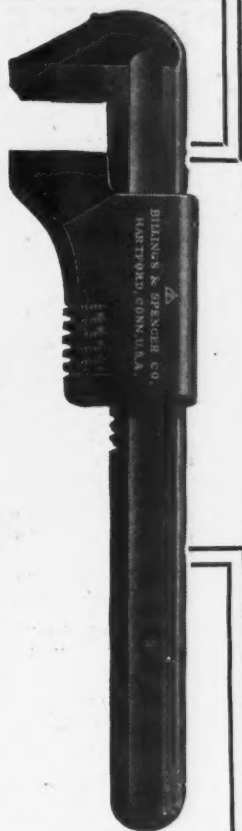
Introduction. Theory of the Gas and Gasoline Engine. The Utilization of Heat and Its Efficiency in Explosive Motors. Retarded Combustion, Wall-Cooling and Compression Efficiencies. Compression in Explosive Motors, and Its Work. Causes of Loss and Inefficiency in Explosive Motors. Economy of the Gas Engine for Electric Lighting, etc., etc. The Material Power in Explosive Engines. Carburetors. Cylinder Capacity of Gas and Gasoline Engines. Governors and Valve Gear. Explosive Motor Ignition. Cylinder Lubricators and Mufflers. Construction Details and Parts of the Explosive Motor. Explosive Motor Dimensions. Types and Details of the Explosive Motor. The Measurement of Power. Management of Explosive Motors. Explosive Engine Testing. The Amateur's Motor, Marine Motors, Motor Bicycles, Tricycles and Automobiles. Kerosene Distilling and Petroleum Oil Motors. Producer Gas and Its Production.

The Class Journal Company

910 S. Michigan Avenue Chicago

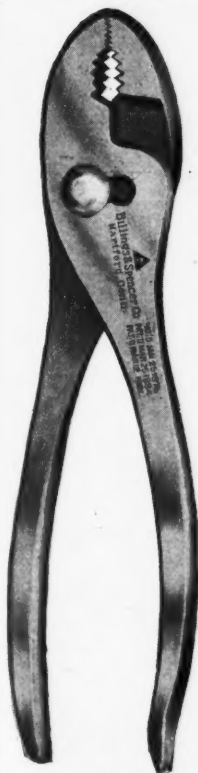
A Pair of Handy Workers

B. & S. Auto Tools meet in all respects the requirements of the motorist. Swift and sure of adjustment. Convenient, easy of action and everlastingly durable. The triangle trade-mark stamped on all



Billings & Spencer Tools

"The tools that are guaranteed"



is a guarantee of a life of maximum service and highest tool-efficiency. Drop-forged from best bar steel, scientifically treated, rigidly inspected. B.&S. Tools for more than 40 years have maintained the highest standard of tool quality. The millions now in use is evidence of their popularity.

Write for catalog and prices

The Billings & Spencer Co.
Hartford, Conn.



For Cold Weather Starting



A Ford Can't Afford to Be Without All-In-One Spark Plugs

A few drops of gasoline poured into the priming-cups of a set of ALL-IN-ONE Spark Plugs will start the stubbornest motor—regardless of the temperature.

ALL-IN-ONE Plugs are admirably adapted to Ford cars as well as to all other make cars on the market.

Motorists: Here's a plug which will prime your motor, increase your engine efficiency, clean itself, help decarbonize your motor, detect that missing cylinder—selling at the same price as an ordinary plug which will do none of these things. Specify ALL-IN-ONE next time.

Price \$1.25 each

FRONTIER SPECIALTY CO.
539-543 Ellicott St. Buffalo, N. Y.



MAYO SPARK PLUG PUMP

A simple and powerful pump adaptable for use on all cars from the smallest Ford to the largest Lozier. Instantly attached by substituting it for a spark plug. Pumps nothing but pure, fresh air. Inflates the tire in from 2 to 4 minutes. Built with metal rings like your engine and will last as long. Requires no attention other than an occasional drop of oil.

Weights only 2½ pounds.
Furnished with adapters to fit any car, 12 feet of hose and connections.
Price \$10.00. With Pressure Gauge, \$2.00 extra.

\$10.00

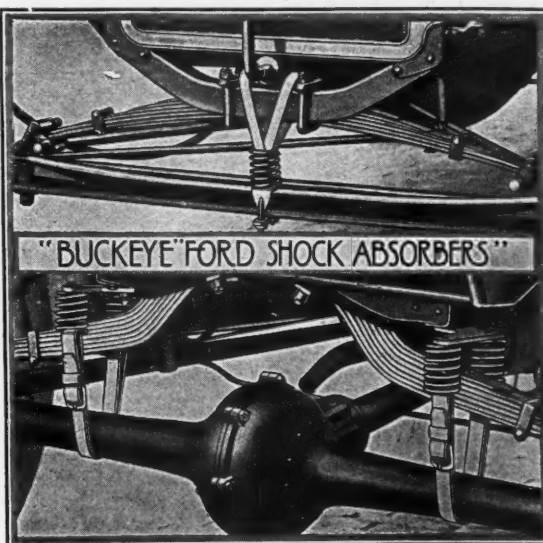
You can try it on your own motor before purchasing

The Mayo Mfg. Co.
55 E. 18th St., Chicago



"Ford" Shock Absorbers

FIVE DOLLARS THE SET



1 FOR FRONT 2 FOR REAR

Made for "Ford" cars only—fitting any model

Our "Buckeye" Ford Shock Absorbers guarantee Easy Riding on the Roughest of Roads.

Absolutely prevent broken springs, the absorbers taking the shock when springs rise above their neutral position. Front absorber also prevents excessive compression of front spring. Full oil tempered springs of best quality—attached in a few minutes' time—no holes to drill—simply clamp to frame.

\$5.00 per Set of Three (Shipping weight, 7 pounds)

At all jobbers and dealers, or sent direct on receipt of price.

Manufactured by

THE CENTRAL BRASS & FIXTURE CO., Springfield, Ohio
CANADIAN DISTRIBUTORS
JOHN MILLEN & SON, Montreal, Toronto, Winnipeg, Vancouver

Starts — Lights — Ignites

REMY

Six Volt System—Does-It-All

WE are the only factory able to assume complete responsibility for the *entire* efficient electrical equipment of your product. Remy apparatus is furnished as a whole—or in any combination. The Starting and Lighting equipment is furnished to manufacturers only.

Risk of obsolete equipment is eliminated; service demands of the individual owners are centered in one factory.

Because the Remy is a fourteen year old concern with a national service organization, you are guaranteed *permanent efficiency*.

Liberal magneto (any make) exchange offer.

Remy Electric Company

General Offices and Works, Anderson, Indiana

BRANCHES:

New York Detroit Kansas City Minneapolis
Boston Chicago San Francisco

(Service stations throughout the country)

The Hollenden

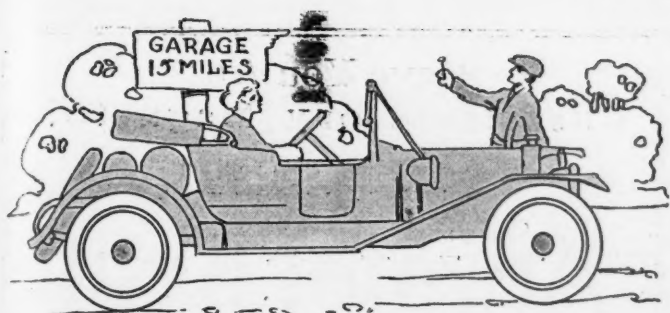
European Plan

800 Rooms

Rate with Bath
\$2.00 to \$5.00

Automobile Headquarters

Cleveland, Ohio

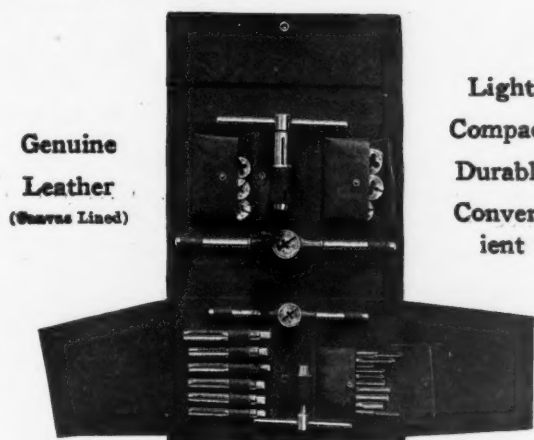


"A Stripped Thread and 15 Miles to a Garage"

Prepare for such an emergency by always carrying with you a set of Wiley & Russell Screw Cutting Tools.



You can cut a screw thread in a few minutes and possibly save yourself being towed in. Especially adapted to Ford Cars. Forty years' manufacturing experience is built into this kit. No garage is complete without it.



Has 16 Taps, 16 Dies, 2 Stocks and 2 Tap Wrenches

MANUFACTURED BY
WILEY & RUSSELL MFG. CO.
GREENFIELD, MASS.

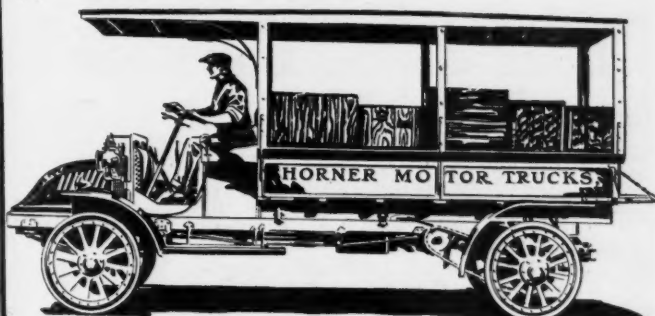
New York
90 Center St.

Philadelphia
38 N. Sixth St.

Chicago
545 W. Washington Blvd.

SEE ONE AT YOUR DEALER'S

A proven truck—An experienced organization



HORNER

Motor Trucks

One to Five Tons Capacities

In offering the Horner to the truck buyer, and in offering the dealer the opportunity to sell it, we present a truck that has been proven by years of use; and an organization built up of men having wide truck experience.

The name Horner is the only new thing about our proposition.

The truck is essentially identical with the Grabowsky, the success of which is well known.

The men who compose the manufacturing, sales and service departments have been engaged in the motor truck business from the very start.

So we have no radically new ideas. We are building on the solid foundation of experience.

We believe we have a splendid factory organization; and we want to build the same kind of an organization to sell Horner Trucks and give service to Horner owners.

We would like to discuss our proposition with well established dealers preliminary to apportionment of territory; and shall be glad to hear from you if experience, good financial equipment and sound business methods interest you.

Detroit-Wyandotte Motor Co.

100 Fourth Street

Wyandotte, Mich.

Veeder

Exactitude

in the mileage of an automobile or motor truck is a primal necessity if you insist upon knowing the upkeep cost of tires, gasoline or "juice" and lubricating consumption. A VEEDER HUB ODOMETER is not only exact but CAN'T BE TAMPERED WITH.

Neat, durable and compact, it can be easily attached. Price complete,

\$25.00

At your dealer's direct from our factory or at the following agencies:

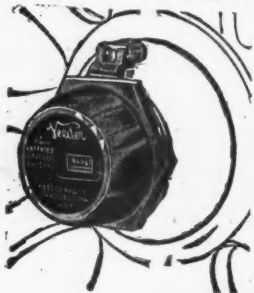
T. H. Cranston & Co., 56 E. Randolph Street, Chicago, Ill.

Bernard I. Bill, 543 Golden Gate Avenue, San Francisco, Cal.

The Veeder Manufacturing Company

C. E. VEEDER, President D. J. POST, Treasurer
H. W. LESTER, Secretary
HARTFORD, CONN.

Makers of Cyclometers, Odometers, Tachometers, Tachometers, Counters and Small Die Castings



Have You An Unsatisfactory Magneto?

Even if your motor has no timer shaft you can nevertheless install

The Atwater Kent Ignition System

by means of our "Magneto Gear Mounting." It fits the standard magneto platform and connects to the magneto drive shaft. The gears it contains are enclosed, smooth running and quiet in operation.

For one-half the price of a new magneto you can replace your old one with an Atwater Kent System which will run your motor as smoothly "on high" at three miles an hour as at thirty or fifty. If you are also interested in increasing the speed, flexibility and hill-climbing ability of your car, you will want a copy of our latest literature describing the Atwater Kent System.



WRITE
FOR
FOLDER "A"

ATWATER KENT MFG WORKS

4934 Stenton Ave.
PHILADELPHIA

THE "Famous Warner Assemblies"

BUILT
BY

THE WARNER GEAR CO.

OF

MUNCIE, IND.

DETROIT OFFICE:
628 FORD BLDG.

Get what your engine owes you!



Your power unit can't "produce" if handicapped. You can't run on dry gears and still get the benefit of the full rating of your engine. There's more in correct lubrication than you may think. Give your engine a chance—

Use BADGER Gear Compound It's "Always on the Teeth"

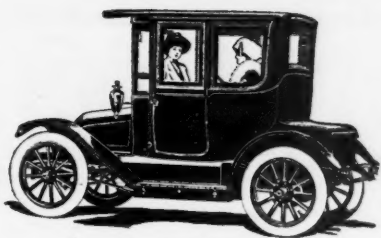
Stays where you put it. Never runs thin, never packs on the sides of the gear case. Every ounce lubricates. Not only conserves your power but is an effective help for noisy transmissions and rear axles. One can make you an enthusiast for all time.

We also make F. V. Motor Oil and Badger Lubricants. See your dealer or write us.

Dealers Write for Territory

Wadham's Oil Co., Milwaukee, Wis.





Buffalo Electrics

"The car you always admire"

SERVING a distinct need, Buffalo Electrics stand alone as the town car. Their claim to the place they occupy is based upon exclusive features—three point motor suspension—direct drive—noiseless running and the wonderfully simple foot control.

That's only a few points. Our catalogue explains others. Send us your name—today.

Special inducements in localities where we are not represented.

BUFFALO ELECTRIC VEHICLE COMPANY

Successors to Babcock Electric Carriage Co.
1219 Main Street Buffalo, N. Y.

A Special Spark Plug for Your Car

"Any old Plug" will not, cannot, give you satisfactory service. There is a particular model that is best suited to each car. And there is a particular make that is best suited to all cars. It is the

HERZ PLUG

"Bougie Mercedes"



FORD TYPE

We make special models for the Ford, the Pierce-Arrow, the Pullman, the Amplex; extra long shanks for the Buick, the Overland, the Maxwell, the Pope-Hartford; and three standard models— $\frac{1}{2}$ -inch, $\frac{7}{8}$ x 18 (A L A M) and metric—which meet the requirements of all other motors.

HERZ PLUG has Double, Unbreakable Stone Insulation (Blue Enamelled) and Four Sparking Points of Platinum-alloy. It is Self-cleaning and Guaranteed a full year

HERZ & CO.

295 Lafayette St. New York
Makers of the HERZ MAGNETO

U-S-L



U-S-L

Takes the place of the Fly-wheel

The U-S-L Electric Starter and Lighter is a combination motor and generator that takes the place of the fly-wheel. The armature of the motor-generator is bolted directly to the engine crank-shaft.

The U-S-L doesn't add a single extra moving part to a car.

No gears or chains	No extra clutches
No added weight	Starts at a push of foot-button
No bearings to oil	Supplies ample current

Adopted by

Rambler, Garford, Edwards-Knight,
Moyer, S. G. V.

Write for Bulletin 501

The U. S. Light & Heating Co.

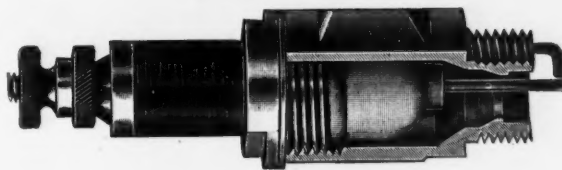
General Offices: 30 Church St., New York

Branch Offices and Service Stations—New York, Boston, Buffalo, Cleveland, Detroit, Chicago, St. Louis, San Francisco.

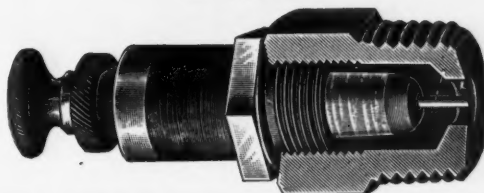
THE OAKES & DOW CO.

SPARK PLUGS

SOOTLESS



COMET



For Highest Compression Engines

In an actual test of 12 best known makes of plugs, our "Sootless" made good—the other eleven could not stand up.

MANUFACTURED AT

15 Chardon Street BOSTON, MASS.

"CAMPBELL"

—WATERPROOF— SEAT COVERS FOR AUTOMOBILES

We make a specialty of
**OVERLAND, HUDSON, CADILLAC, FORD, HUP-
MOBILE, STUDEBAKER COVERS**

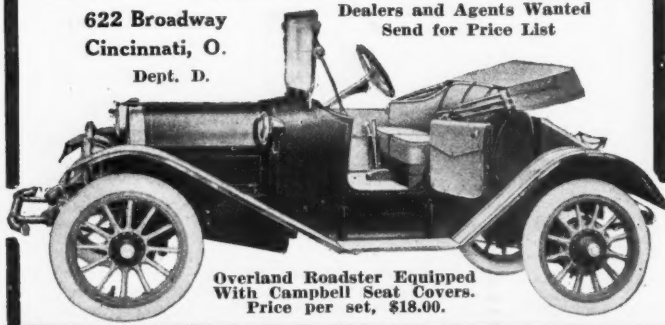
"Let us improve the looks of your car 100 per cent."

Our covers are made right and fit right. They are made of waterproof, drab cloth and bound with the best material obtainable.

LET US SHOW YOU OUR CONTRACT PROPOSITION
THE PERKINS CAMPBELL COMPANY

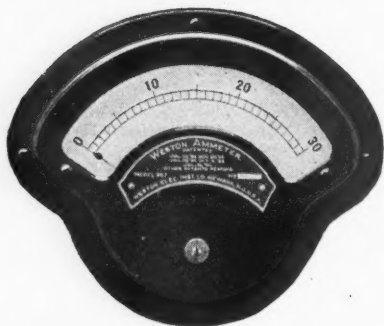
622 Broadway
Cincinnati, O.
Dept. D.

Dealers and Agents Wanted
Send for Price List



Overland Roadster Equipped
With Campbell Seat Covers.
Price per set, \$18.00.

**A reliable Electrical
Measuring Instrument
indicates quality.**



Weston Model 267 Dashboard Ammeter

WESTON AMMETERS

for control of Electric Lighting and Self-Starting
Systems are the most reliable, durable and highest
grade instruments made for this purpose.

Please send for our 30-page
bulletin No. 8 describing them

Weston Electrical Instrument Co.
NEWARK, N. J.

New York	Boston	Denver	Birmingham	Montreal
Philadelphia	San Francisco	Cleveland	Toronto	Paris
Chicago	St. Louis	Detroit	London	Berlin

EMPIRE

Porcelains—

You can crack them with
a hammer

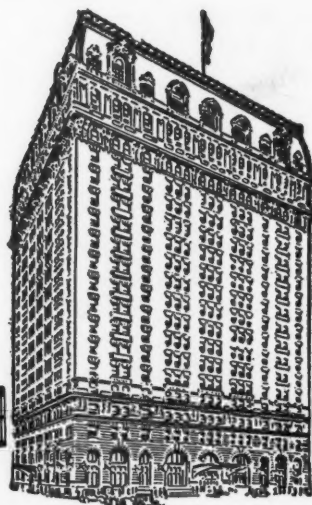
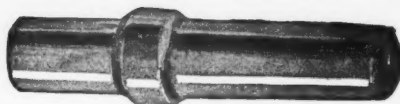
No motor cylinder has ever become hot enough to crack one of them, however. And it's in the cylinder that a spark plug COUNTS—not under a hammer.

Spark plug manufacturers who want a porcelain that is as tough and rugged as human hands can make it, will specify "EMPIRE."

Manufactured by expert workmen, of specially selected kaolin imported from Cornwall. Fired at a temperature of 2,600° F.—many times greater than any heat met with in actual service. Subjected to brutal efficiency tests for breakage and long life.

Write for Sample and Catalogue

Empire China Works
142-156 Greene St., Brooklyn, N.Y.



Hotel La Salle

CHICAGO'S FINEST HOTEL

ERNEST J. STEVENS, Vice-Pres. and Mgr.

Located in the heart of the city, within easy reach of all railway terminals

RATES

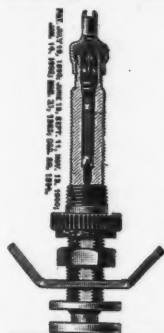
ONE PERSON	Room with detached bath.....	\$2 to \$3 per day
	Room with private bath.....	\$3 to \$5 per day
TWO PERSONS	Room with detached bath.....	\$3 to \$5 per day
	Room with private bath.....	\$5 to \$8 per day
TWO CONNECTING ROOMS WITH BATH		
Two persons	\$5 to \$8 per day
Four persons	\$8 to \$15 per day
SUITES	\$10 to \$35 per day

LA SALLE AT MADISON STREET, CHICAGO

Schrader Universal Valves

Established 1844
Trade Mark Registered April 30, 1905

Simple and Absolutely Air Tight



Schrader Motor Valves, as shown in cut, are the regular equipment on all styles of pneumatic tires for automobiles. Our No. 777 Tire Valve is the standard for 2½-inch and 3-inch Automobile Tires, and our No. 725 Tire Valve is the standard for tires larger than 3-inch.

These are made in different lengths, to fit different styles of tires and rims.

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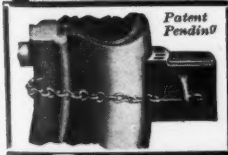
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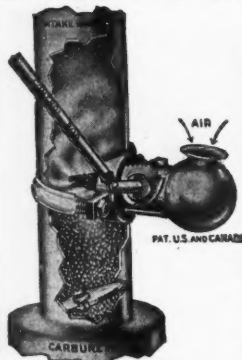
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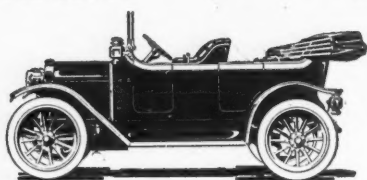
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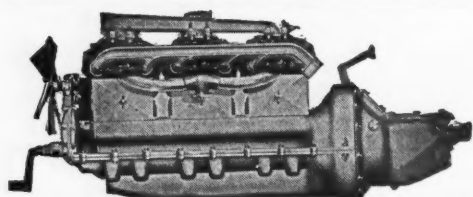


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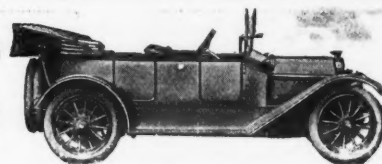
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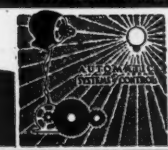
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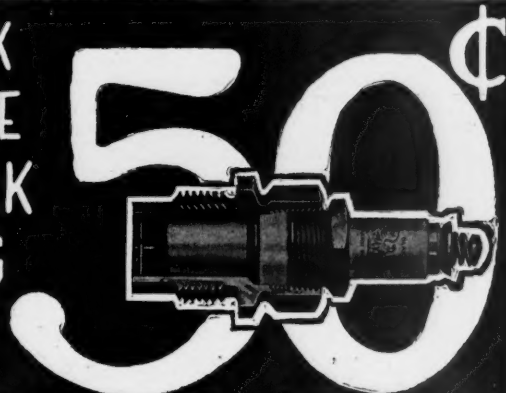
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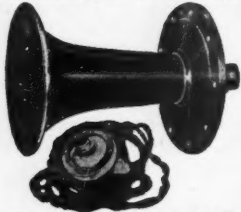
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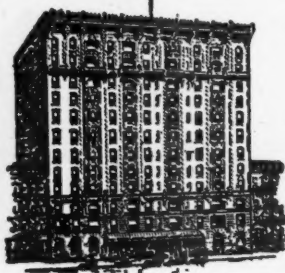
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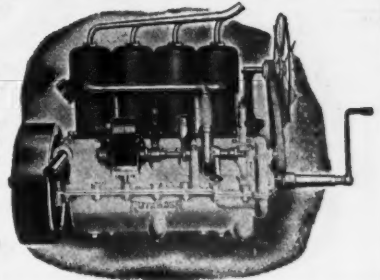
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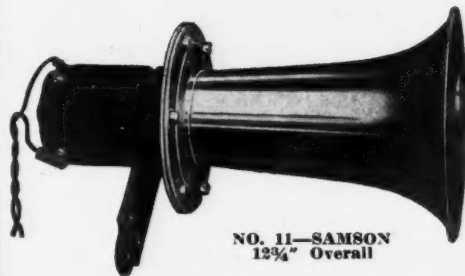
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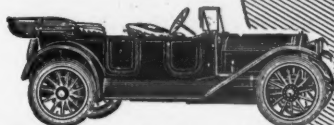
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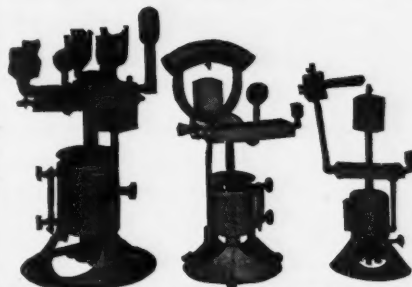
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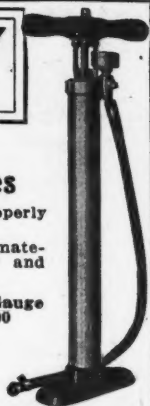
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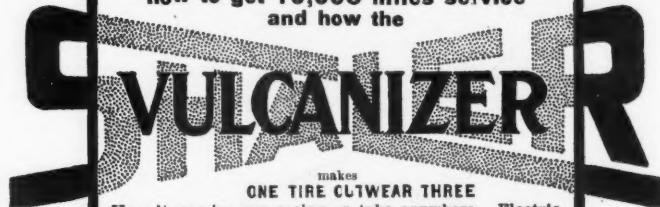
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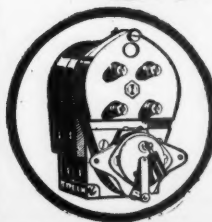


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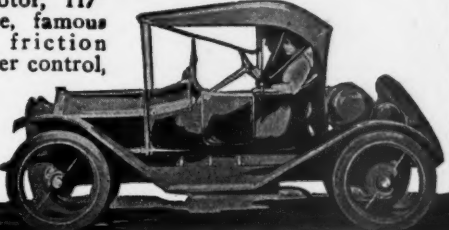
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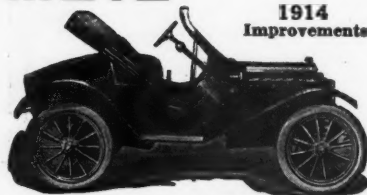
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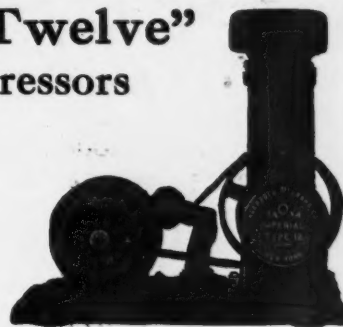
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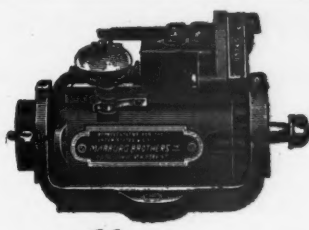
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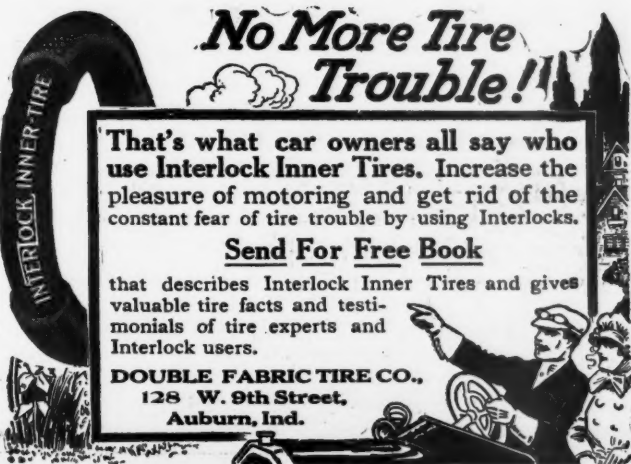
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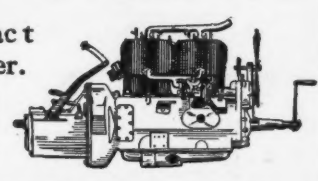
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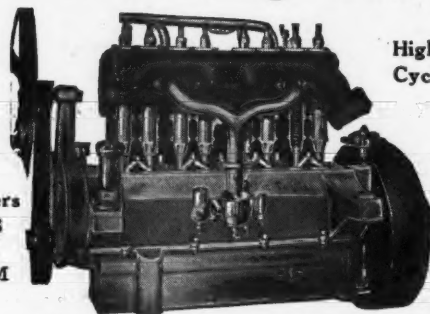
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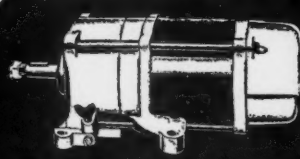
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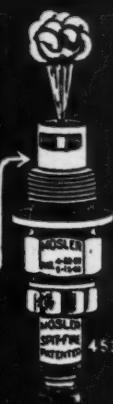
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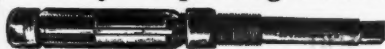
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Send for our new catalogue before buying accessories. We guarantee lowest prices consistent with quality.

M.M. Sales Company

Reading, Pa.

APCO—FORD SPECIALTIES

There Are Forty of Them
FREE CATALOG

AUTO PARTS CO. Providence, R. I.

Peerless Lamp Enamel (Gloss)

Dries in twelve hours on lamps with a high gloss finish. One coat covers solid. If a dull, drying enamel is desired, please specify. 1 gal., \$3.75; ½ gal., \$1.98; ¼ gal., \$1.04; ⅛ gal., \$0.54.

Peerless Jet Black Fender Japan

A heavy bodied, high gloss finish, air drying in thirty-six hours. One coat covers solid. 1 gal., \$3.75; ½ gal., \$1.98; ¼ gal., \$1.04; ⅛ gal., \$0.54.

Peerless Auto Body Polish

A brightener and restorer to the finish of all old varnished surfaces. Especially adapted for automobile bodies where the life of the varnish is worn out. 1 gal., \$3.50; ½ gal., \$1.86; ¼ gal., \$0.98; ⅛ gal., \$0.51.

Peerless Cylinder Enamel

A black gloss finish not affected by grease, heat or gasoline. Keeps the engine clean. 1 gal., \$3.75; ½ gal., \$1.98; ¼ gal., \$1.04; ⅛ gal., \$0.54.

Peerless Extra Fine Black Baking Japan

For brass, nickel or iron. Bakes to a high gloss, eggshell gloss or dull finish that will not crack, chip or peel. 1 gal., \$3.75; ½ gal., \$1.98; ¼ gal., \$1.04; ⅛ gal., \$0.54.

Ask your dealer and jobber,
or send direct to us

The Columbus Varnish Co.
COLUMBUS, OHIO

\$40.00 Disco **\$5.00**
Self Starter for

We are selling these Starters at this enormous reduction to advertise our "Free Price Wrecker," which contains a thousand other bargains. So write immediately and secure one of these well-known Disco Self Starters at less than cost of manufacture. Will make your old car up-to-date.

Times Square Automobile Co.

S. W. Cor. 56th St. and Broadway, N. Y. 1212 Michigan Ave., Chicago

TIRES — TIRES

All New 1913 Stock

Direct from leading tire manufacturers

WHILE THEY LAST

Size	Casing	Tubing	Reinforc.
28x3	\$ 7.20	\$1.90	\$1.80
30x3	7.65	1.95	1.90
32x3	7.80	2.05	1.95
30x3½	11.00	2.70	2.60
32x3½	12.00	2.90	2.60
32x4	15.70	3.60	2.80
33x4	16.00	3.70	2.85
34x4	17.25	3.80	2.90
35x4	17.50	3.90	2.95

C. O. D. orders sent same day as received upon receipt of 10%, subject to your examination.

PARA AUTO TIRE CO.

Phone Calumet 2814
1419 MICHIGAN AVE. CHICAGO

CLASSIFIED ADVERTISEMENTS

The Trading Center
of the
Motor Car Industry

MOTOR AGE

Rates—25¢ per line
Minimum Charge \$1.00
6 words to a line

Cars For Sale

A LATE DOUBLE "M" FORTY HORSE-POWER White Steamer; fine condition and fully equipped, including kerosene burner. Has not run three thousand miles. Will sell cheap. Address Box D 469, c/o Motor Age. w

AUTOMOBILES AND PARTS; LARGEST stock ever known.
Progress Brokerage Co.,
527 Grant St., Buffalo, N. Y.

AUTOMOBILES—HIGH CLASS, RELIABLE cars at prices representing the greatest values in New York. Space limits us to give you but an idea of the dozens of attractive propositions we offer: Cadillacs, '12, touring, \$850; '11, demi-tonneau, \$500; '11, roadster, \$400; '10, touring, \$300. Hudsons—'13, touring, \$1000; '12, touring, \$700; '11, roadster and touring, \$300. Chalmers, '12, touring, \$600; '10, touring, \$250. Ford, '12, touring, with extra roadster body, \$250; '11, touring, \$200; runabout, \$150. Buicks, '10, roadster, \$175; toy-tonneau, \$200. To those who desire the rakish type of low hung roadsters we offer among others '12 Mercer; '12 Stutz Bearcat; American Scout; Regal; Paige-Detroit, and Hupmobile "32" at sacrifice prices. Seven passenger cars of great variety—Packards, Pierces, Peerless, etc. A great selection of limousine, landaulet, coupe and taxi-bodies, \$50 up. It will pay you to pay us a call tomorrow. King-Shonnard Co., Dept. 2, 1919 Broadway, New York City.

BARGAINS.

1908 Pierce Arrow "60," seven passenger touring car. Equipped with top, curtains, envelope, seat covers, wind shield, speedometer, clock, Klaxon horn, gas headlights, dash and tail lamps, Prest-O-Lite tank, five extra tubes, tire cover, demountable rims, 37x5 inch tires in rear, two extra Pullman seats. Car is in excellent condition.

1909 Pierce Arrow 6-60 four passenger roadster. Equipped with top, curtains, envelope, wind shield, speedometer, clock, special horn, electric generator, complete set of electric lamps, Q. D. demountable rims, one extra casing, tool box with tools, battery box with batteries. Car recently painted gray and is in good running condition. Tires are in good shape.

1912 Stoddard Dayton, Saybrook four passenger coupe, 50 H. P. Equipped with gas headlights, dash and tail lamps, Prest-O-Lite tank, horn, Continental Q. D. demountable rims, one extra rim, one set of chains. Used very little. Fine shape.

1910 Stoddard Dayton "F-50," seven passenger touring car. Equipped with top, curtains, envelope, wind shield, speedometer, clock, gas headlights, combination oil and electric side and tail lamps, Prest-O-Lite tank, quick detachable rims, two extra casings and tubes, one tire cover, one set of tire chains, tool box, battery box, two extra seats. Car is in good running condition.

1912 Staver five passenger touring car. Equipped with top, curtains, envelope, seat covers, wind shield, speedometer, Klaxon horn, complete set of lamps, Prest-O-Lite tank, Q. D. demountable rims, two extra rims, two extra casings and tubes, one tire cover, one set of tire chains. Car is in good running condition.

PACKARD MOTOR CAR CO. OF CHICAGO,
2357 Michigan Ave., Chicago.

FOR SALE—STODDARD-DAYTON, 1912, 60 H. P., four cylinder, seven passenger, color gray, nickel trimmings, Gray & Davis starter and lighting outfit, Kellogg four cylinder motor driven air pump, and otherwise fully equipped. Completely rebuilt and repainted March, 1913. In first class condition. Cost, \$3,500; price, \$1,775. Address Box D. 506, c/o Motor Age. b

DEMONSTRATORS, 1913, 67 H. P., SEVEN passenger, perfect order; the strongest cars built; big sacrifice; three cars to select from; write for catalogue. Pilot Car, 17 First St., Troy, N. Y. o

FOR SALE—1 4-CYLINDER REGAL TAXI- cab, in good running order; this is a great money maker for rental service; price, \$350. Borbein Auto Co., 2109 N. 9th St., St. Louis.

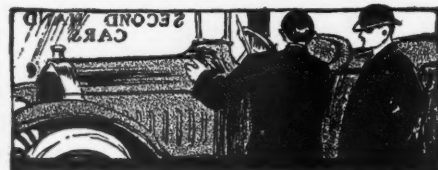
FOR SALE—A 1913, 60 HORSEPOWER, SIX passenger Norwalk Car, that cost \$3,100 in June last. In perfect condition. This is a demonstrating car, used by a Washington firm that failed in July.

Until Friday, Sept. 12th, this car can be seen at the factory of the Norwalk Company in Martinsburg. After that time at the private garage of Geo. R. Bready, Harpers Ferry, W. Va., where a competent chauffeur will be at the service of prospective buyers.

Address
Geo. R. Bready, Harpers Ferry, W. Va.

FOR SALE—NORWALK UNDERSLUNG Six, Model A, Two-Passenger Roadster. Very little used. Have purchased 1914 Model with Electric Gear Shift, reason for selling. Right price to quick buyer.

T. G. Coppersmith,
126 W. Exchange St., Martinsburg, W. Va.



A Good Reason

"We do not care to repeat the advertisement in reference to the Knight car at this time. We sold it through the MOTOR AGE advertisement. That's why."
H. H. W.

FOR SALE—1 MODEL 16, FOUR PASSENGER Buick Roadster, at \$500.00. This car in first class condition. Address
D. T. Sutherland,
Bainbridge, Ga.

FOR SALE—1 MODEL 17 FIVE PASSENGER Buick touring car at \$600.00. One Model A. B. Maxwell runabout at \$350.00. Both cars are in first-class condition. Address
KENNEDY AUTO SUPPLY CO.,
Collins, Iowa.

FOR SALE—1 STUDEBAKER "35" COUPE, absolutely new with full equipment. List price \$1,850 F. O. B. factory. Will sell for \$1,550, account of handling a different line of cars for the coming season. Also 1 Studebaker "20" Touring Car in first-class condition \$500, and 1 Studebaker "30" 1912 Touring Car in first-class condition \$650. Anderson Automobile Company, Sewickley, Pa.

FOR SALE—1913 MOON DEMONSTRATOR, Model 48 K, run 1,400 miles, better than new; will be sold at a bargain. Address Box D 502, care Motor Age. p

FOR SALE—1911 ABBOTT-DETROIT TOUR- ing car, 30 horsepower, good condition, two spare tires and tubes, electric lighting. Price, \$350. H. A. Tarantous, 1730 Prairie Avenue, Chicago.

LANCIA, 20 H. P. MODEL WITH ROOMY but small appearing five-passenger touring body. Fully equipped. In thorough mechanical repair. Owner, Box 844 New York. 1

MITCHELLS, REBUILT, GUARANTEED. These cars are fully equipped. Call or write for further particulars.
Mitchell Automobile Co.,
2334-36-38 Michigan Ave., Chicago.

NEVER BUY NEW OR REBUILT AUTOS and accessories without information from us. We recommend the best. Your first inquiry, not exceeding ten questions, answered free. Number questions. Details free. Dept. J., P. I. Assn., Box 1001, Hartford, Ct.

SELDEN, 1912, 5 PASSENGER, FULLY equipped, demountable rims, with extra tire and rim. Up-to-date in every way. A good buy for someone wishing a good car at a low price. Condon, 2635 Wabash Ave., Chicago.

"30-60" 5 PASSENGER STEARNS, JUST overhauled and repainted, new tires, demountable rims, with new extra tires. This is a snap for some one wishing a high-powered car at a bargain. Condon, 2635 Wabash Ave., Chicago.

Parts and Accessories FOR SALE

ACCESSORY CATALOG MAILED ON RE- quest. Maxwell dealers and owners, we can supply tops, shields, etc., for your cars. Lowest prices, all goods. Write us. Westchester Accessories Co., 1777 Broadway, N. Y. City.

ACME REPAIR PARTS

We carry a complete stock of parts for all types of Acme cars. Can ship promptly. Adam E. Arnold, 212 S. 11th St., Reading, Pa.

ATTENTION—HENRY OWNERS

Having purchased the repair business of the Henry Motor Co., we are prepared to fill orders promptly for repairs for Henry cars. Muskegon Automobile Co., Muskegon, Mich.

AUTOMATIC SPEEDER AND PRIMER. Every car owner should have one, saves 25% on gasoline, starts motor with first turn of crank. The most rapid selling automobile device on the market. Agents wanted. Price, \$7.50 f. o. b. Frankfort. Automatic Device Co., 551 E. Jefferson St., Frankfort, Ind.

A WHITE STEAMER, GENERATOR AND burner, almost new. Will sell cheap. Address Box D 245, c/o Motor Age. w

BALL & ROLLER BEARINGS.

All Types and Sizes.
We also repair or exchange all makes of ball bearings.
THE GWILLIAM CO., 253 W. 58th St., N. Y.
1314 Arch St., Philadelphia.

BEARINGS—TIMKEN, HESS-BRIGHT, S. R. B., R. I. V., and other makes, 64 to 80 % discount. Most all sizes. Tell us size you want or send for our complete list.
AUTOMOBILE APPLIANCE CO.,
1714 S. Michigan Ave., Chicago, Ill.

BERGDOLL REPAIR PARTS.

The repair business of the Bergdoll cars, together with all drawings, jigs, patterns, etc., has been purchased by us. We have a complete stock of repair parts for all models on hand and orders for parts for Bergdoll cars should be placed with us direct to save time.

Louis J. Bergdoll Motor Co.,
124 N. 3rd St., Philadelphia.

BRIGGS 4 CYL., 1913 TYPE MAGNETO \$10.00 each.

J. B. Farr,
45 E. Fort St., Detroit, Mich. 1

BRAND NEW WINDSHIELDS

30 CENTS ON THE DOLLAR.

All sizes; black, brass or nickel; straight or zig-zag. French plate glass. Give size, style and finish desired.

BRAND NEW TOPS

Made for Flanders "20" touring cars. Made of finest mohair; complete with irons, side and storm curtains. Can be fitted to FORD, FLANDERS "20" and BUICK "10" touring cars. Price \$11.85.

ERWIN GREER & COMPANY,
1456-64 Wabash Ave., Chicago.
Accessory Dept.

COMPLETE "VULCAN PROCESS"

of oxy-acetylene welding plants from \$175 for the blacksmith and garage plant up to largest made. Torch light weight. No backfiring in ordinary work. Write today for our booklet on welding.

Vulcan Process Co.,
25th and University Ave. S. E.,
Minneapolis, Minn.

CUT-OUTS.

E.M.F., Flanders, Buick, Regal, etc. Complete outfit with brass lock open pedal, \$1.50. Lincoln Machine Shop, Lincoln, Ill.

DOES YOUR MOHAIR AND CANVAS TOP leak? Coleman's Waterproof Filler will make it rainproof. It will not stiffen or change the color. Virginia Waterproofing Corp., Arcade Bldg., Norfolk, Va.

DRAGON REPAIR PARTS.

We manufacture and keep on hand all repair parts for the Dragon cars. We make a specialty of repairing this machine. Philadelphia Machine Works, 67 Laurel St., Philadelphia, Pa.

ELECTRIC LIGHTS FOR FORD CARS (self-contained system), including rectifier and battery. Also light controllers for use with headlight sets. American Battery Co., 1124 Fulton St., Chicago.

E. F. LOWTHER'S

Famous Auto and Carriage top dressing warranted one year or money refunded. Waterproof. Will not crack, stick or rub off; \$1.00 per quart or \$3.00 per gal. Orders promptly filled. 1289½ N. High St., Columbus, Ohio.

FORD CAR WIRE WHEELS.

Demountable wire wheels interchangeable all around, built especially for Ford cars. Five wheels to a set, enabling you to carry spare wheel with inflated tire, and make quick change.

THE F. & H. WIRE WHEEL CO.,
Columbus, Ohio.

FORD OWNERS—WE CAN MAKE YOUR car the easiest rider made with light or heavy load; no jolt, no jars, no upthrow. Write us. Thomas Auxiliary Spring Co., Canisteo, N. Y.

FORD FAN BELTS, WOVEN COTTON AND silk; outlasts six regular belts. Postpaid, 60c. Dealers, write, Angler's, Streator, Ill.

FORD, HUPP AND MAXWELL

Muffler cut-out, machined ready to attach. Including lock open pedal string and cables. \$1.35. Lincoln Machine Shop, Lincoln, Ill. c

FORD LIGHTING OUTFITS, \$5.50.

Includes parabolic reflectors, tungsten bulbs, wiring switch and free delivery. Truscott Auto Supply Co., St. Joseph, Mich.

FORD OWNERS AND DEALERS!

You will save trouble and money by installing our timer elevating device.

Ford Parts Specialty Co.,
1211 Main St., Richmond, Ind.

FORD OWNERS—FORD DEALERS

Perfect lubrication with Pedersen Sight Feed Oiling System. Designed especially for Ford Cars. Write for special agents proposition.

Rowland & Lopez,
1777 Broadway, New York City.

FORD OWNERS—OUR SPARE DEMOUNTABLE wheel cures tire trouble on road. Doctors' attention. Write Angler's, Streator, Ill.

FORD OWNERS.

Enter your order with us at once and take advantage of the following bargains while they last.

Ford Lighting Outfits \$ 5.50
Clamp On Ford Bumpers..... 4.00
Spark Plugs35
Electric Horns, "Electra and Bulldog". 2.90
Ford Oil Gauges35
Ford Valve Stem Adjusters..... 1.25
Tires 30" x 3", New..... 9.75
Tires 30" x 3½", New..... 14.00

Write for list on other bargains. Terms, cash with order. Money back if not satisfied. AUTOMOBILE SUPPLY & MACHINE CO., 50 Rowland Bldg., Detroit, Mich.

FORD T. OWNERS.

Foot throttle or accelerators, \$1.50. Lincoln Machine Shop, Lincoln, Ill. c

FORE-DOOR BODIES, SIX AND SEVEN passenger; painted, not upholstered. Price, \$25.00.

AUTOMOBILE APPLIANCE CO.,
1714 S. Michigan Ave., Chicago, Ill.

FORE-DOORS AT CUT PRICES.

Mr. Auto Owner and Dealer: If your car is without fore-doors, write today for bargain prices; to reduce stock.

DEPT. D., AUTO SPECIALTY MFG. CO.,

326-30 E. Market St.,
Indianapolis, Ind.



More Than Satisfied

"Please change our advertisement to read as per enclosed matter. Run until further notice. We have steadily secured excellent results from our ads in MOTOR AGE and are more than satisfied."

L. D. S.

FORE DOORS

We are prepared to make prompt shipment from stock and guarantee the doors to fit or money returned.

F. E. LORTZ CO.,
1237 Mich. Ave., Chicago, Ill.

FORE DOORS FOR OPEN FRONT CARS—

Prices right. A postal will bring particulars. Economy Service Co., Box 650, Indianapolis, Ind.

FOR SALE.

2 cylinder upright, 8 H. P., Cushman gas engine and Northern generator, 65 volts, 17-35 amperes. Complete with truck, belts, switches and all equipment. Nearly new. Give best offer first letter. Address Plaza Theatre, Box 432, Springfield, Minn. e

FOR SALE—BODY, TOP AND CUSHIONS. 1913 Model T. Ford Touring Car. Absolutely new. Peebles Motor Car Co., Wilmington, Ohio.

FOR SALE—BOSCH DUAL D-6 MAGNETO with coil, \$55; 50 h. p. Pope Toledo engine, \$75; 24 h. p. Pope engine, \$50. Pope Toledo parts for sale. Auto Salvage Co., 1436 Wabash Ave., Chicago.

FOR SALE—ONE MILLER VULCANIZING plant, complete, price \$250. For particulars write R. J. Marquard, 405 No. 6th St., Springfield, Ill.

FOR SALE—SECOND HAND AUTO PARTS. Will sell cheap. Write for prices.

E. W. Senn,
Hendricks, Minn.

FOR SALE—\$2,000 STOCK OF ESSENKAY, sizes 3 to 5 inch, inclusive. Will sell at 75 per cent off list price. The Marksheffel Motor Company, Colorado Springs, Colo.

GOULD \$50.00 AIR COMPRESSORS FOR \$18.00. Ford outfits \$4.00 complete. Fred Allen Automobile Supply Co., 1610 S. Michigan Ave., Chicago, Ill.

GET WRIGHT

Radiators for Replacement. Built for any car made. Prompt shipment. Get our prices.

Specials This Month.
Buick 17—\$34.00 Velle 30—\$30.00
Hudson 20—\$32.00 Hupmobile 32—\$30.00
Wright Cooler & Hood Co.,
8th St., Muskegon, Mich.

LATEST FORD ROADSTER BODY, \$88. Tops, curtains included. Macialis Bros., Toledo, O.

LION REPAIR PARTS.

We have on hand a complete stock of repair parts for all models of Lion Cars.

Lion Motor Parts Co.,
124 N. 3rd St., Philadelphia, Pa.

MAGNETOS: WE HAVE 2,000 MODEL X Splitdorf Magnetos, new. Price, without coil, \$17.50 each; with coil, \$25.00 each. The regular price of these is \$75.00.

We also have other makes of magnetos at cut prices—in fact, everything for the automobile. Send for "OUR PRICE WRECKER"—the greatest money saver in the world.

TIMES SQUARE AUTO CO.,
1210 Michigan Blvd., Chicago, Ill.
S. W. Cor. 56th St. & Broadway, N. Y. City.

MAKE CASH OFFER FOR

O. B. PORTABLE AIR COMPRESSOR. Practically new, suitable private or small public garage. Bids kept open one month. Any bid may be rejected. Address Box D 512, c/o Motor Age. h

MORA REPAIR PARTS.

We purchased the repair business of the Mora Company and have in stock repair parts for all models of Mora cars.

Philadelphia Machine Works,
67 Laurel St., Philadelphia, Pa.

MOSLER SPITFIRE PLUGS.

Price, \$1.50. Our price.....\$0.35

MOSLER SPITFIRE PLUGS,

Long Shank,
Ford Size.

Platinum point Mosler Spitfire Plugs.... .50

Ford Rubber Mats..... 1.00
Ford Wheel Pullers..... 1.00
Ford Auto Locks..... 1.00
Ford Anti-rattling ball sockets..... 1.00
Ford spring bumpers..... 1.00
Ford fan belts30
Ford radiator caps40
Ford Cut-out Outfits 1.00
Ford Foot Accelerators 2.50
Ford Gaskets50
Ford electric horns 2.85
Ford Master Vibrators 6.00

Get Our Bargain Sheet.

CUT PRICE AUTO SUPPLY CO.

438 Rush St.,
CHICAGO, ILL.

"OWNERS NOTICE."

CARBON IN YOUR CYLINDERS Will cause you more trouble than enough. M. H. B. CARBON REMOVER eliminates engine trouble, reduces repair bills; apply it yourself.

ACTS LIKE MAGIC.

Guaranteed to do the work or money refunded. Price \$1.00 per quart prepaid. Use 2 ounces (liquid) to one gallon of oil. Dealers, write for special proposition.

Interstate Mfg. Co., Inc.,
Wallston, Mass.

MR. (FORD) OWNER AND GARAGE MAN,
The Townsman Valve Adjuster has a cushion for your valve-stems. Takes away the click, absolutely silencing the valves. No screws or burrs to work loose. Saves putting in new push-rods and valve-stems. They never wear out. Price \$1.50 by mail. Ask your jobber, or address Townsman Auto Specialty Co., Mitchell, S. D.

RADIATORS.

Every radiator guaranteed absolutely new not a reconstructed one.

In stock for immediate shipment.

Ford Model "T".....	\$18.00
Buick 10-14.....	27.50
Buick F-16-17-19-26-27-28.....	35.00
Hudson 20.....	33.00
Chalmers F-40.....	30.00
Hupp 32.....	25.00
E-M-F 30.....	30.00
Anhut.....	15.00
Northern C.....	32.00
Wayne 30.....	35.00
Special 40 H. P.....	15.00

5% discount allowed for cash with order. Otherwise one-third cash with order, balance C. O. D.

AUTOPARTS MANUFACTURING COMPANY

453 Trombly Avenue, Detroit, Mich.

RADIATORS

To order for all cars.

We use copper fins and tubes.

You can buy brass cheaper, but the cooling efficiency is not there.

Black enamel, baked finish, \$2.00 extra.

Terms cash with order, or one-third deposit with C. O. D. shipments.

\$5.00 Trade Allowance for old radiator shipped in F. O. B. Detroit.	
Ford Model T.....	\$22.00
Ford Model R. S. & N.....	25.00
Hupmobile 1910-1911.....	28.00
Hupmobile 1912-13.....	38.00
Warren 1910-1911-1912.....	35.00
Packards to sample, \$50 to.....	65.00
E. M. F. 30.....	35.00
Flanders 20.....	30.00
Patterson 30.....	35.00
Buick 10-14-32-33.....	30.00
Buick 16-17-19-26-27-28.....	35.00
Hudson 20.....	32.00
Hudson 33.....	40.00
Cadillac 30.....	35.00
Paige 1910-1911.....	28.00
Paige 1912.....	30.00

SPECIALS.

Electric tail lamps, complete, each.....	1.25
12" bullet headlights, complete, pair.....	12.00
1 model F Thomas radiator, cellular type.....	40.00
R. C. H. headlight, 8", pair.....	3.00
Vehicle lamps, red and white light, each.....	.75
Oil tail lamps, each.....	1.25
Oil side lamps, pair.....	3.00
Regal 30 dashboards, each.....	1.00
15" Barnes' drill, good as new.....	33.00
HURON RADIATOR & LAMP COMPANY, 253-255 Jefferson Ave., Detroit, Mich.	

RADIATORS—NEW GUARANTEED GOODS	
Ford, Model T.....	\$16
Buick, Model 10.....	22
Buick, Model F.....	25
Chalmers-Detroit.....	20
Everett.....	20
Stoddard-Dayton.....	25

Any other make required at equally low prices.

The Times Square Automobile Co.,
1210-1212 Michigan Ave., Chicago.

RADIATORS, 40 TO 60 HORSEPOWER, \$22.
Get our list of bargains.
AUTOMOBILE APPLIANCE CO.
1714 S. Michigan Ave., Chicago, Ill.

SCHLEBLER MODEL "L" CARBURETORS,
new, 1 1/2-inch, \$5.00 each. Order early.
Kent Motor Car Co., Kenosha, Wis.

"SAVE YOUR GASOLINE."

We have 150 Rayfield carburetors, regular \$20.00 kind. Our price, \$8.20 while they last.
PURITAN MACHINE CO.,
415 Lafayette Blvd., Detroit, Mich.

SEAT COVERS FOR ALL CARS.

Special price on Ford seat covers. We make a specialty of Ford commercial bodies.
Auto-Cape Top Co.,
2334 Michigan Ave., Chicago, Ill.

REMOVAL SALE.

YOUR LAST OPPORTUNITY

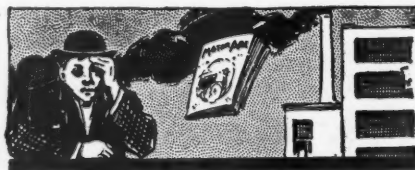
TO BUY THESE GOODS AT SUCH A
RIDICULOUS PRICE.

Four cylinder motors, new, air-cooled...\$60.00
Timken I-Beam front axles..... 25.00
Timken full floating rear axles..... 75.00
Guaranteed tires and tubes, 10%, 7 1/2% and
5% for cash from the standard list.

Get our Removal Sale Bargain Sheet.

AUTO PARTS CO.,
513-31 Jackson Blvd.,
CHICAGO.

SILVER PLATING WITH U-KAN-PLATE
Polish. Small capital; profitable work.
A. R. JUSTICE CO.,
619 Chestnut St. Philadelphia, Pa.



Good Results

"Enclosed find check in payment for advertising in **MOTOR AGE**, two insertions. We have had good results from this ad and you will herewith find enclosed copy for six more insertions." **A. H. Y.**

START YOUR FORD THE COLDEST
morning with a single cranking. For 50 cents I will send you detailed sketch of a little device that I have used on my Ford the past three winters with absolute success. Can be made at your local shop for 50 cents. No priming, no cussing, no sweating. She will run on the first spin, or money back.
D. H. LIVINGSTON,
Cedar Rapids, Ia.

THE REAR LIGHT ALARM
is one of the most important inventions in the history of motoring. It is a device which audibly indicates when the rear light is out. The cause may be a broken bulb or filament, faulty connection or broken wire; any of which causes the

REAR LIGHT ALARM
to instantly sound. One fine saved will pay for it; lives may be saved by its use. Sent from the factory complete with a length of wire for connecting and full directions for installation; \$5.00 postpaid.

THE GUARANTEED SPECIALTIES CO.,
NEWARK, N. J.

TIME TO PUT ON TIRE CHAINS

For slippery weather. **HANDI-HOOKS** put them on for you in mud, snow or on garage floor in one-third the time, without soiling hands or clothing. Pair sent on receipt of 50 cents.

Consumers' Auto Supply Co.
Fisher Bldg., Chicago

TOP BARGAINS.

New 4-passenger tops, suitable for Flanders 20 Suburban Cars and Buick 10 Surrey. Top only.....\$5.00
New Everitt 6-48 Silk Mohair Tops complete with curtains and dust hood...\$18.50
Send in your check while tops last.
AUTOPARTS MANUFACTURING CO.,
Detroit, Mich.

TIRE RELINERS, INNER SHOES & boots. Special prices. Send for catalog.
American Rubber Products Co.
26 So. Clinton St., Chicago, Ill.

TOURING, ROADSTER, RACING BODIES.
Seats, special and stock sizes. Radiators, hoods, tanks and fenders for any car. Get our prices.

Auto Sheet Metal Works,
1534 Michigan Ave., Chicago.

TOPS BUILT, RECOVERED AND RE-paired.

C. G. Meyer & Son, Tiffin, Ohio.

TRUFFAULT-HARTFORD SHOCK ABSORBERS; \$45.00 kind; \$20.00 set of four.
PURITAN MACHINE CO.,
417 Lafayette Blvd., Detroit, Mich.

TWO CYLINDER ENGINE, \$20; REAR axle for small car, \$12.
M. A. Smith,
Lansdowne, Pa.

UNION OXY CARBIDE CO.

Manufacturers of Portable (weight 40 lbs.) and stationary welding, cutting or lighting plants; supplies of all kinds. Agents wanted.
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WE MAKE FORD RACING TYPE BODIES
in several models for immediate delivery.
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WE NOW HAVE BUT A FEW 30-35 AND 35-40 H. P. motors ready for shipment. Complete with magneto, coil and clutch. **F. E. Alford, Goshen, Ind.**

WESTON MOTT HIGH GRADE REAR axles, \$45.00. Other bargains, too.
PURITAN MACHINE CO.,
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WRITE THE GUN METAL FINISH CO.,
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4 CYL. 4 CYCLE, 25 H. P. NEW MOTORS, overstock, 3 bearing crank shaft, large bearings, self-contained oiling system, complete with timers and carburetors, \$105.
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2,000 GALLON GASOLINE SECOND HAND storage tank, 3/16" boiler plate, painted, tested and guaranteed; 14" screw top with pressure blow off. Will sell cheap. **Martindale & Millikan, Franklin, Ind.**

50% GASOLINE SAVING MACHINE
AUTOMATIC GUARANTEED. PRICE \$4.
The installing is very simple and can be done by the owner himself in a few minutes.
Dealers write for terms.
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50 NEW PRESSED STEEL FRAMES 163" long, 34" wide. Each \$10.00. Send for sketch.
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FUR LINED OVERCOATS AT ONE-fourth value. Manufacturers' samples. Gentlemen's imported black broadcloth overcoats, lined with finest Australian mink, large handsome Persian lamb collar. All sizes. Retail value \$120. While they last will be sacrificed for \$35 each. First come, first served. You take no risk. Examine and try on before paying. Write today, stating size, enclosing express charges only, and coat will be sent at once. **E. Roberts, Room 7, 160 West 119th St., New York.**

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WANTED—4 CYLINDER MARMON AIR cooled engine, '08 or '07 model. Must be perfect, and cheap for cash. Box D 524, c/o Motor Age.

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Have customers waiting; if you want to sell your car quick, consign it to us; no charge whatever; we get our profits over your net figure; it is your privilege to remove car at any time without notice; will send for your car free within 200 miles.

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I AM AN AA REGISTERED RACING driver. Would like to take up the matter with private owner or with the factory for next year's races, or take the part of chauffeur this winter for private party. Address Box D-521, c/o Motor Age. w

POSITION WANTED AS FOREMAN OF automobile repair shop by first class mechanic of long experience. Desires a position that will be permanent and where good salary will be paid for faithful and efficient service. West or Northwest preferred. Address Box D 501, c/o Motor Age. c

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ENGINEERS, SUPERINTENDENTS, Works Managers, Designers, Production and Efficiency Engineers, and Draftsmen with Automobile experience. Inquiries confidential; record must stand investigation when desired. The Engineering Agency, Inc.—20th Year—Chicago.

EXPERIENCED AUTOMOBILE MEN Wanted. For every branch of the industry. We are Automobile Position Specialists and a member of S. A. E. The Toledo Engineering Agency, Toledo, O.

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WANTED AN EXPERIENCED MAN TO handle position as Salesmanager in Wholesale Automobile Accessory firm. Prefer one acquainted with this line or the hardware line, but not an entirely essential qualification. However, must have road experience as well as experience in handling salesmen. Opportunity for advancement.

Gibson Automobile Company,
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WANTED — COMPETENT AUTOMOBILE repairman, one familiar with Chalmers cars and able to do lathe work. Married man preferred; steady position year around. Address Box D-522, c/o Motor Age. 1

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Splendid location for auto accessories, tires, etc., located on Wabash avenue, opposite Coliseum. Rent reasonable; long or short lease. A. A. Newman, Room 302, 8 So. Dearborn St., Chicago.

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"I have filled the positions referred to, and have received numerous applications, so discontinue the ad. Rest assured that when we need additional salesmen, we will take pleasure in giving you the advertisement." E. H. C.

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Owing to the death of the secretary and treasurer of a New York incorporated automobile manufacturing company, the right man with some knowledge of the automobile industry and ten thousand dollars cash can secure 50% of the stock of this corporation, owning patents covering certain new and essential devices that will startle the commercial automobile industry. There are no liabilities. Unlimited foreign and American field. Simply a legitimate, ground-floor proposition for the right man.

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We send you any shoe of standard make with the maker's guarantee at a low figure.

We also send you with each shoe one of our Security Reliners which is guaranteed absolutely to double the tire makers mileage and thereby save you untold expense, at a special price according to the size desired.

You can't afford to overlook this proposition. Specify size of shoe desired, and get one of the best propositions ever offered to any owner.

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All standard makes at the following prices:

Size	Price	Size	Price
30x3 1/2	\$14.50	34x4 1/2	\$27.00
32x3 1/2	16.00	35x4 1/2	28.00
32x4	20.00	36x4 1/2	29.00
34x4	22.50	36x5	31.50
36x4	24.50	37x5	32.50

I do not carry any but standard make tires or deal in inferior brands. I will ship any size tire listed above to any part of the U. S. upon receipt of 10% of order, balance C. O. D. M. C. Moran, 334 Amsterdam Ave., New York City.

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Your opportunity if you own a Ford, have salesman's ability, and live in a small town where we have no agency for

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Twenty-five per cent Heavier—Tougher— and Stronger cases—and Heavy Red Tubes.

These tires make your car ride easier—give you more mileage, save too frequent blowouts and other tire trouble.

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Get your name in today before your neighbor does.

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I will sell you good wrapped tread clincher tires cheaper than any one in the United States. New 1913 stock. 34x4 Case, \$14, all other prices accordingly. Write for prices.
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MANUFACTURERS' AGENT, LOCATED at 119-125 Finsbury Pavement, London, England, with Showroom, Warehouse and Garage, desires sole agency for Great Britain on a commission basis for accessories, also light car to sell about \$500, commission payable only when bills are settled. Address Florian Hyam, as above.

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We guarantee all our work.
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We guarantee the welds.
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Indiana Ave. and Eighteenth St., Chicago, in the very center of the automobile district. 75c to \$1.50 per day; with bath \$1.00 to \$2.00. Clean, comfortable rooms. Fine 40c table d'hôte. Take South Side trolley to door.

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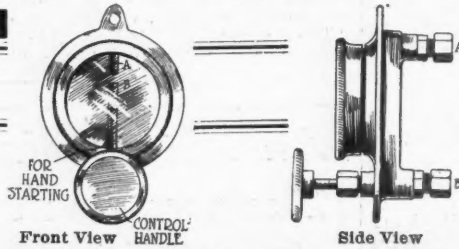
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Webb-Jay Sight-Feed Primer

Automatically primes the motor without your raising the hood.

In winter you adjust your carburetor to give a rich starting mixture. As a result your mixture is too rich throughout the carburetor's entire range. You waste gallons of 20c fuel which don't deliver one guinea-pig power to your crank-shaft. On the other hand, auxiliary carburetor attachments, aimed to make for easy starting, hinder carburetion—make the carburetor do something it was never intended to do. The Webb Jay Sight-Feed Primer permits you to set your carburetor at its most efficient and economical adjustment and keep it there. The Webb Jay Primer takes care of easy starting, relieves the carburetor of the job. With this Primer you never adjust your carburetor from one season's end to another. You need no auxiliary attachments. This Primer can be installed by a school boy. **Explanation:** Pipe line "A" is in connection with supply line from main gas tank to carburetor; pipe line "B" with intake manifold. Glass priming cup on dash fills automatically by motor suction. Turn control handle to admit gasoline to cylinders, priming them. When engine has warmed up, close control.

Price \$6.00 each. Sent prepaid on receipt of price.

If not satisfactory, after 30 days' use, your money refunded. Some territory still open to agents.

Webb Jay Motor Devices Co.
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This new list of ignition apparatus will interest you. Send for a copy today to our nearest house.

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is a complete line of reliable appliances including everything electrical for the automobile.

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WESTERN ELECTRIC COMPANY**

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Equipment for Every Electrical Need

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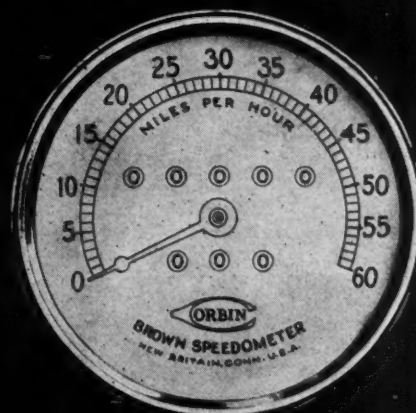
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The Speedometer of Absolute Accuracy



The solid link provides a smooth bearing. Friction is thus minimized and smooth running insured.

The strength of these links makes breaking almost impossible. If one should break, replacing is so simple a matter that anyone can do it.

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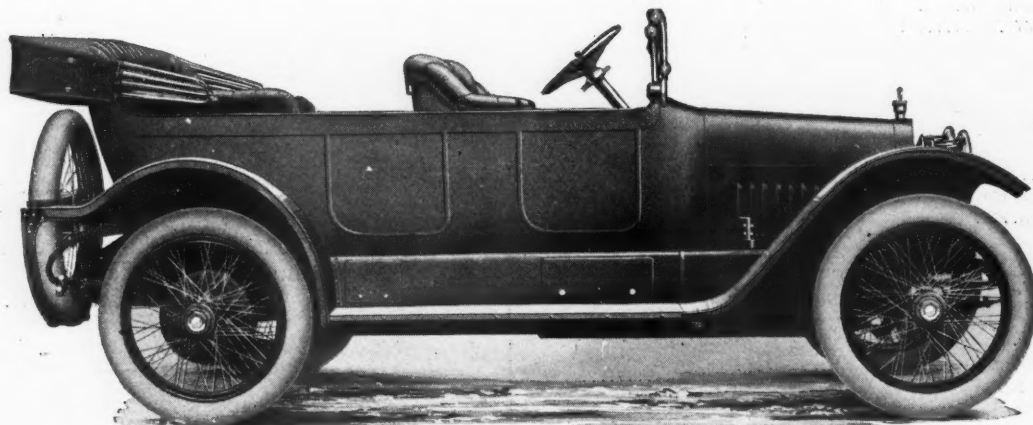
—consider what it would mean to sell a car so simple in construction—so free from complications—that a minimum of attention is required after the sale.

Consider what it would mean to have the owner so well satisfied that he is constantly **working for you.**

And consider what it would mean to enjoy the prestige which goes with the name Stearns—to know that you are backed up by one of the oldest and strongest manufacturers in the industry.

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Stearns-Knight Four-Cylinder Five-Passenger Touring Car (Wire Wheels Extra)

The new 1914 series of Stearns-Knight cars are the most noteworthy models ever produced. In addition to the wonderfully efficient power plant, the best ideas of late American and European practice have been incorporated in a remarkably wide range of models.

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Combine In a Perfect Mounting the Finest Type
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Axle of the Highest Grade



More fortunate than the early users of the worm drive abroad, motor car builders in America can utilize in a complete form the finest known type of this gear, in an axle of equally assured quality.

The Lanchester-Daimler Worm Drive mounted in a full-floating "*American*" Axle, fitted with the best of foreign made ball-bearings, constitutes the last word in design, material and workmanship as known to the motor car axle industry today.

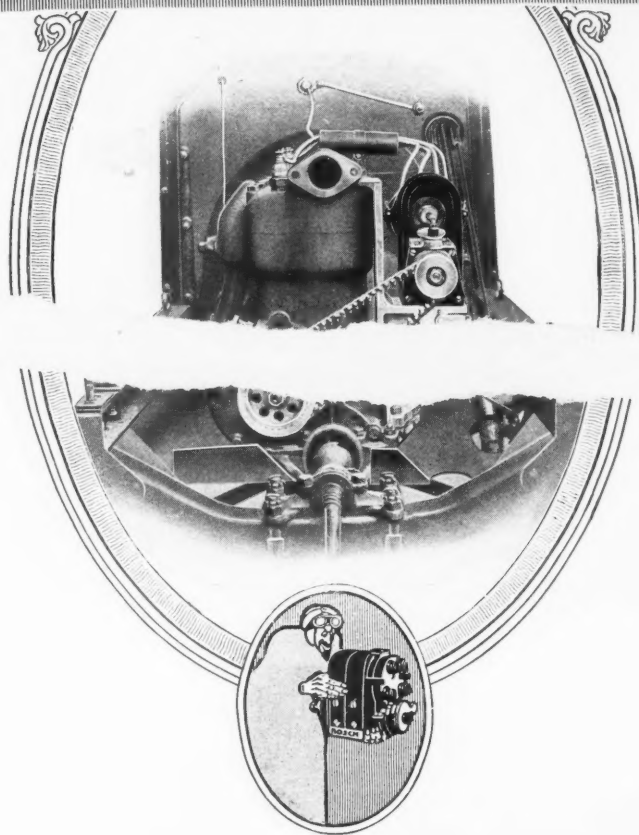
We do not think that there can be any dispute as to the individual superiority of each of the factors named. They are to be found—in their combined form—in "*American*" Axles only, and they are offered with entire confidence, for use in either gasoline or electric pleasure cars of the highest grade.

It is not necessary to say more for this axle than that it is, in every way, the equal of our "*American*" Bevel Drive Axle, which, wherever found, indicates a car of exceptional quality.

The adjusting and full-floating features of
American Axles are fully covered by our own
patents and by shop rights from other patentees

The American Ball-Bearing Co., Cleveland, Ohio

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Gives Ford Cars Maximum Efficiency

*A Bosch Magneto for Ignition
A Ford Generator for Lighting*

THE Bosch-Ford System has been designed to meet an urgent appeal for a more efficient and reliable ignition system; one that would eliminate preignition, overheating and the inherent difficulties and harmful effects of unsynchronized ignition.

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Every Ford owner and all those engaged in the sale and repair of motor cars should investigate this proposition without delay.

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